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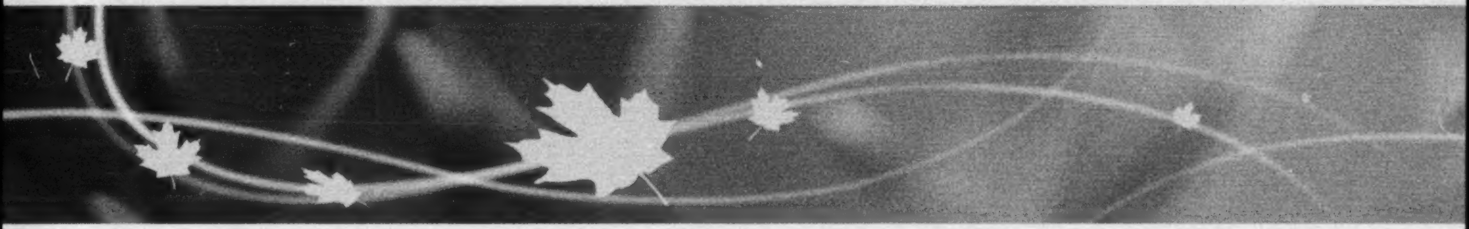
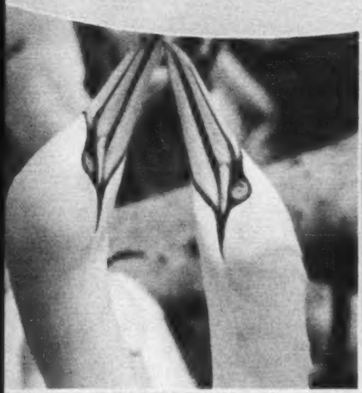
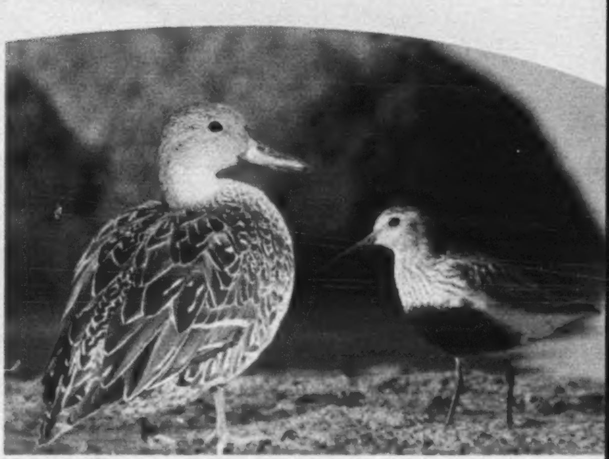


Bird Conservation Strategy for Bird Conservation Region 7 and Marine Biogeographic Unit 10 in Newfoundland and Labrador – Taiga Shield and Hudson Plains and Newfoundland-Labrador Shelves

January 2014





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Cat. No.: CW66-320/5-2014E-PDF
ISBN: 978-1-100-21085-8

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Preface

Environment Canada led the development of all-bird conservation strategies in each of Canada's Bird Conservation Regions (BCRs) by drafting new strategies and integrating new and existing strategies into an all-bird framework. These integrated all-bird conservation strategies will serve as a basis for implementing bird conservation across Canada, and will also guide Canadian support for conservation work in other countries important to Canada's migrant birds. Input to the strategies from Environment Canada's conservation partners is as essential as their collaboration in implementing their recommendations.

Environment Canada has developed national standards for strategies to ensure consistency of approach across BCRs. Bird Conservation Strategies will provide the context from which specific implementation plans can be developed for each BCR, building on the programs currently in place through Joint Ventures or other partnerships. Landowners including Aboriginal peoples will be consulted prior to implementation.

Conservation objectives and recommended actions from the conservation strategies will be used as the biological basis to develop guidelines and beneficial management practices that support compliance with regulations under the *Migratory Birds Convention Act, 1994*.

Acknowledgements

This document follows templates developed by Alaine Camfield, Judith Kennedy and Elsie Krebs with the help of the BCR planners in each of the Canadian Wildlife Service regions throughout Canada. However, work of this scope cannot be accomplished without the contribution of other colleagues who provided or validated technical information, commented on earlier draft versions of the strategy, and supported the planning process. We would like to extend a sincere thanks to the following people: Karyne Bellehumeur, Doug Bliss, Andrew Boyne, Paul Chamberland, Kevin Davidson, Michael Elliott, Carina Gjerdrum, Alan Hanson, Christie MacDonald, Paul MacDonald, Bryan Martin, Bruce Pollard, Martin Raillard, Isabelle Robichaud, Dane Stuckel, Peter Thomas, Kyle Wellband, Becky Whittam and other reviewers.

Recommended citation:

Environment Canada. 2013. *Bird Conservation Strategy for Bird Conservation Region 7 and Marine Biogeographic Unit 10 in Newfoundland and Labrador – Taiga Shield and Hudson Plains and Newfoundland-Labrador Shelves.* Canadian Wildlife Service, Environment Canada. Sackville, New Brunswick. iv + 113 pp. + appendices.

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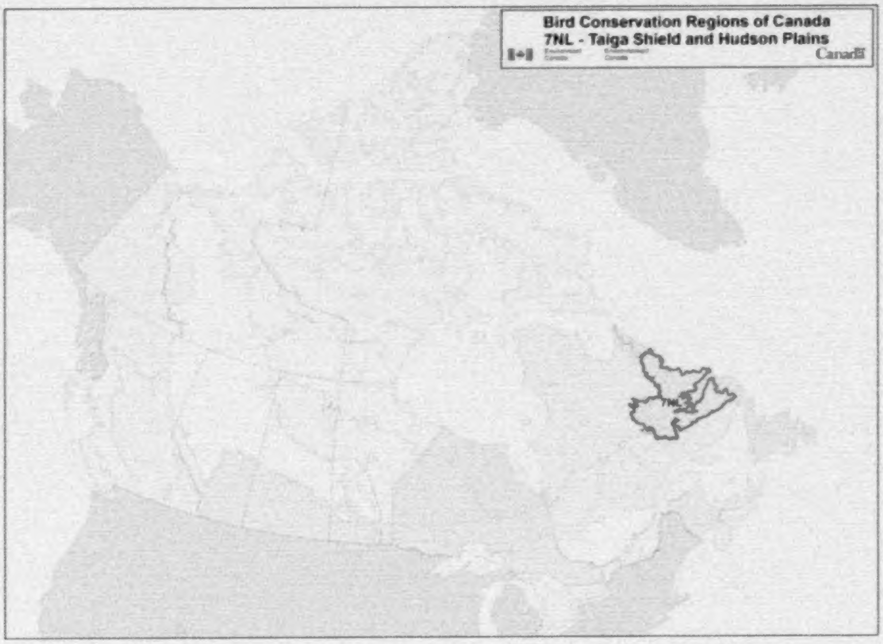
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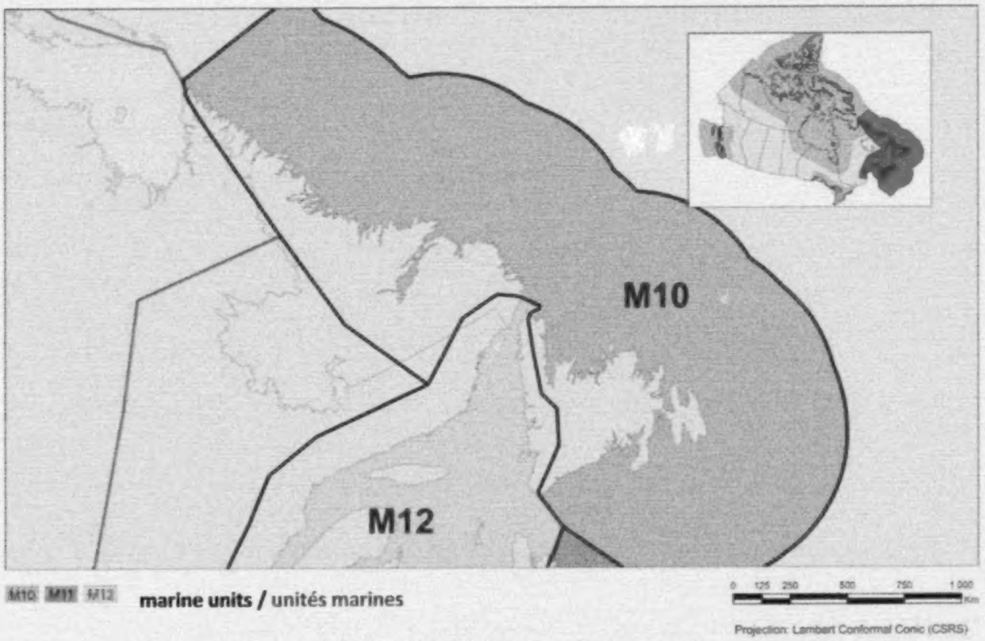
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Executive Summary

This strategy compiles the best available information from the literature on bird conservation in Newfoundland and Labrador. It identifies priority species for conservation, the key threats affecting them and the major conservation actions required to protect them. Its goal is to become a useful tool for future conservation planning, where important information on bird conservation is conveniently pulled together and displayed. It builds on existing bird conservation strategies and complements those created for the other Bird Conservation Regions (BCRs) across Canada using the best available information extracted from a national database. Collectively, the strategies will serve as a framework for implementing bird conservation nationally, and also identify international conservation issues for Canada's priority birds. Strategies are not prescriptive, but rather are intended to guide future implementation efforts undertaken by various partners and stakeholders. Below is an outline of the priority species groups and the main threats and conservation actions identified.

The entire BCR 7 (Taiga Shield and Hudson Plains) encompasses eastern Northwest Territories, southern Nunavut, northern Manitoba and Ontario, as well as north-central Quebec and Labrador. The Newfoundland and Labrador portion of BCR 7 (BCR 7 NL) is entirely contained within Labrador and covers 77% of its surface area. The region is a combination of transitional forests, covering over 40% of the land mass, and approximately equal amounts of tundra to the north and coniferous forests to the south. Numerous lakes and wetlands can also be found within glacially carved depressions.

Though wetlands are not as common on the landscape as coniferous forests or herbaceous habitats, wetlands are used by the greatest number of priority bird species (19 species). Coastal habitat (above high tide) and coniferous forests are also important, as they are used by 15 and 14 priority species, respectively. In the Newfoundland-Labrador Shelves marine unit (MBU 10 NL), both intertidal coast and marine waters are important to priority species.

There are 36 priority bird species in BCR 7 NL, including 18 landbirds, 6 shorebirds, 3 waterbirds and 9 waterfowl species. In MBU 10 NL, 39 priority species have been identified, including 1 landbird, 8 shorebirds, 18 waterbirds and 12 waterfowl species. There are 6 (17%) priority species in BCR 7 NL and 5 (13%) in MBU 10 NL that are formally protected under the Government of Canada's *Species at Risk Act* (SARA).

The majority of the population objectives (50%) assigned to priority species in BCR 7 NL are to "assess/maintain", which indicates insufficient data to reliably assess a trend and the need for additional monitoring for these species. Maintaining current population size was the objective attributed to 42% of priority species, indicating that these populations or species are relatively stable. Population declines were identified for 8% of species, and these were assigned population increases of either 50% or 100%. In MBU 10 NL, there are insufficient data to reliably assess a trend for the majority of priority species (74%), therefore their population objectives are to "assess/maintain". Fifteen percent (15%) of priority species have a population objective of "maintain current", while 10% have identified population declines and were given

population objectives to either recover or increase population size by 50% or 100%. The Piping Plover (*melodus*) and Ivory Gull have specific recovery objectives described in their respective SARA Recovery Strategies.

There are a variety of current and potential threats to the region's avifauna. The most frequently identified threat to priority species in BCR 7 NL was a lack of information on the distribution, abundance and trends of species, reflecting the need for further research and monitoring. Habitat degradation and increased mortality from climate change were also significant threats to species. Other threats include mortality from collisions, habitat degradation from forestry practices and development, and mortality from hunting and incidental take. For species in MBU 10 NL, the most significant threat by far was from contamination from industrial and military sources, including mercury and PCBs. A lack of information on priority species was also a significant issue for species in this planning unit.

Conservation objectives and associated actions were identified to address the key threats to priority species. There are a variety of objectives and recommended actions; however, the most frequently identified conservation objectives in BCR 7 NL and MBU 10 NL are improving our understanding of priority bird species, ensuring adequate habitat, and reducing mortality or increasing the productivity of species. A combination of beneficial management practices, restoration of natural habitats, site protection and management, public education, and changes in legislation could help alleviate many of the identified threats to priority species in these planning units.

We hope that the information in this strategy provides a useful tool to guide future conservation action, especially habitat conservation, as it presents relevant information on priority species, threats and conservation actions in a summary format.

Introduction: Bird Conservation Strategies

Context

This document is one of a suite of Bird Conservation Region strategies (BCR strategies) that have been drafted by Environment Canada for all regions of Canada. These strategies respond to Environment Canada's need for integrated and clearly articulated bird conservation priorities to support the implementation of Canada's migratory birds program, both domestically and internationally. This suite of strategies builds on existing conservation plans for the four "bird groups" (waterfowl,[1] waterbirds,[2] shorebirds[3] and landbirds[4]) in most regions of Canada, as well as on national and continental plans, and includes birds under provincial/territorial jurisdiction. These new strategies also establish standard conservation planning methods across Canada and fill gaps, as previous regional plans do not cover all areas of Canada or all bird groups.

These strategies present a compendium of required actions based on the general philosophy of achieving scientifically based desired population levels as promoted by the four pillar initiatives of bird conservation. Desired population levels are not necessarily the same as minimum viable or sustainable populations, but represent the state of the habitat/landscape at a time prior to recent dramatic population declines in many species from threats known and unknown. The threats identified in these strategies were compiled using currently available scientific information and expert opinion. The corresponding conservation objectives and actions will contribute to stabilizing populations at desired levels.

The BCR strategies are not highly prescriptive. In most cases, practitioners will need to consult additional information sources at local scales to provide sufficient detail to implement the recommendations of the strategies. Tools such as beneficial management practices will also be helpful in guiding implementation. Partners interested in participating in the implementation of these strategies, such as those involved in the habitat Joint Ventures established under the North American Waterfowl Management Plan (NAWMP), are familiar with the type of detailed implementation planning required to coordinate and undertake on-the-ground activities.

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[1] NAWMP Plan Committee 2004.

[2] Milko et al. 2003.

[3] Donaldson et al. 2000.

[4] Rich et al. 2004.

Strategy Structure

This strategy includes two distinct Canadian planning units: Bird Conservation Region 7 in Newfoundland and Labrador (BCR 7 NL), as well as Marine Biogeographic Unit 10 along the entire coast of Labrador and the eastern and southern coasts of the island of Newfoundland (MBU 10 NL). These units have distinct lists of priority bird species. The MBU has only two of the Land Cover Classification System habitat classes: waterbodies, snow & ice and coastal. To distinguish them from the equivalent habitat classes in BCR 7 NL, they are referred to as marine waters and coastal (intertidal) in the MBU, but as inland waterbodies and coastal (above high tide) in BCR 7 NL.

While the French islands of St. Pierre and Miquelon are in MBU 10 NL, threats to priority birds in the French Exclusive Economic Zone are covered under Section 3: Threats Outside Canada. None of the conservation actions that address threats to priority birds of MBU 10 NL are proposed for French territory or France's Exclusive Economic Zone. All maps should also be understood to exclude French territory and Exclusive Economic Zone.

Section 1 of this strategy presents general information about the BCR/MBU and the subregion, with an overview of the six elements[5] that provide a summary of the state of bird conservation at the subregional level. Section 2 provides more detail on the threats, objectives and actions for priority species grouped by each of the broad habitat types in the subregion. Section 3 presents additional widespread conservation issues that are not specific to a particular habitat or were not captured by the threat assessment for individual species, as well as research and monitoring needs, and threats to migratory birds while they are outside Canada. The approach and methodology are summarized in the appendices, but details are available in a separate document (Kennedy et al. 2012). A national database houses all the underlying information summarized in this strategy and is available from Environment Canada.

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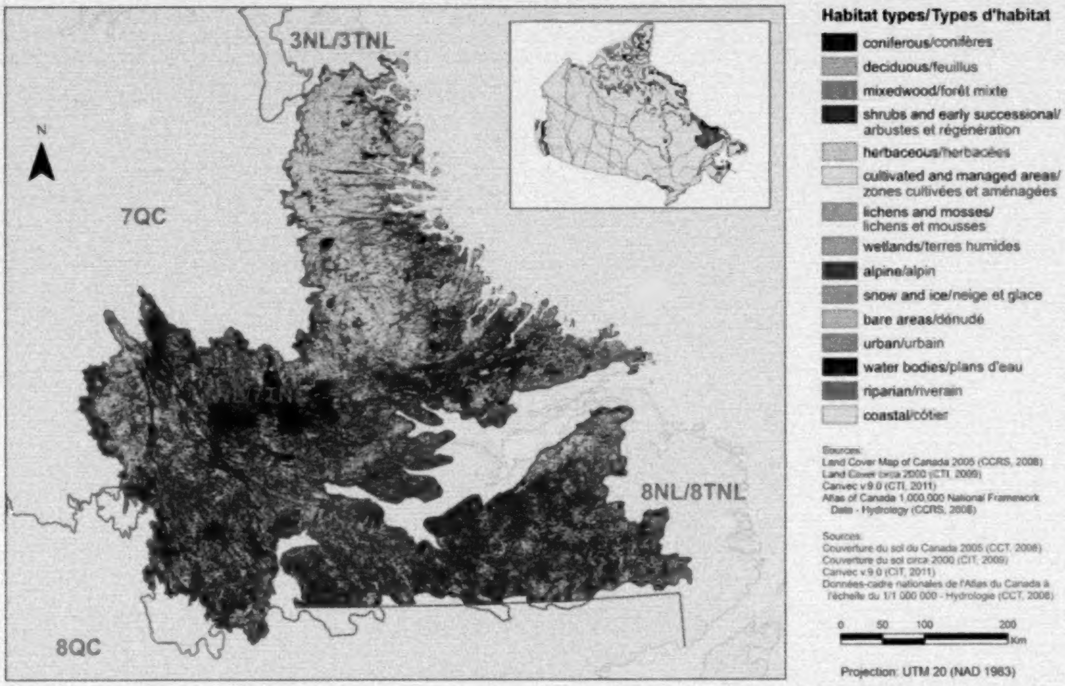
[5] The six elements are: Element 1 – Priority Species Assessment; Element 2 – Habitats Important to Priority Species; Element 3 – Population Objectives; Element 4 – Threat Assessment for Priority Species; Element 5 – Conservation Objectives; Element 6 – Recommended Actions.

Characteristics of Bird Conservation Region 7: Taiga Shield and Hudson Plains in Newfoundland and Labrador

The entire BCR 7 (Taiga Shield and Hudson Plains) covers an area greater than 1 725 000 km^2 extended over the Canadian Shield, which encompasses eastern Northwest Territories, southern Nunavut, northern Manitoba and Ontario, as well as north-central Quebec and Labrador (Environment Canada 2011). This general region is mostly comprised of upland and riverine sites that are covered by open, mixed forests. Thousands of lakes and wetlands occur in glacially carved depressions, and peat-covered lowlands are commonly waterlogged or wet for prolonged periods due to discontinuous but widespread permafrost. The Hudson Plains in the centre of the BCR is one of the most extensive area of wetlands in the world. Dense sedge-moss-lichen associations cover poorly drained sites while open spruce and tamarack woodlands occur in better-drained sites. Coastal marshes and extensive tidal flats are also present along the coastline (North American Bird Conservation Initiative 2013).

The Newfoundland and Labrador portion of BCR 7 is entirely contained within Labrador and covers 77% of its surface area (approx. 220 000 km^2), including western, central and some northern regions of Labrador. This specific region reflects the combination of transitional forests, covering over 40% of the land area, between approximately equal amounts of tundra to the north and coniferous forest to the south (Fig. 1). Numerous lakes and wetlands can also be found within glacially carved depressions. Vegetation varies from open forests of black (*Picea mariana*) and white spruce (*Picea glauca*), and balsam fir (*Abies balsamea*) to shrublands and meadows. The forest stands have associated lichens and transition into areas of open arctic tundra. The treeline occurs along the northern edge of this ecozone. In the central portion of the zone, there are undersized black spruce and jack pine (*Pinus banksiana*), along with tamarack (*Larix laricina*), mountain alder (*Alnus incana*) and willow (*Salix spp.*), which are found in fens and bogs. Riverbanks, streams and upland sites support tree species such as white spruce (*Picea glauca*), trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*) and white birch (*Betula papyrifera;* North American Bird Conservation Initiative 2013). The tundra landscape is characterized by bare soil, rocky outcrops, lichens and very little vegetation (Fig. 1).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Habitat types/Types d'habitat
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deciduous/feuillus
mixedwood/forêt mixte
shrubs and early successional/ arbustes et régénération
herbaceous/herbacées
cultivated and managed areas/ zones cultivées et aménagées
lichens and mosses/ lichens et mousses
wetlands/terres humides
alpine/alpin
snow and ice/neige et glace
bare areas/dénudé
urban/urbain
water bodies/plans d'eau
riparian/riverain
coastal/côtier
0 50 100 200
Km

Sources:
Land Cover Map of Canada 2005 (CCRS, 2008)
Land Cover circa 2000 (CTI, 2009)
Canvec v.9.0 (CTI, 2011)
Atlas of Canada 1,000,000 National Framework
Data - Hydrology (CCRS, 2008)

Sources:
Couverture du sol du Canada 2005 (CCT, 2008)
Couverture du sol circa 2000 (CIT, 2009)
Canvec v.9.0 (CIT, 2011)
Données-cadre nationales de l'Atlas du Canada à
l'échelle du 1/1 000 000 - Hydrologie (CCT, 2008)

Projection: UTM 20 (NAD 1983)

Figure 1. Land cover in BCR 7 NL.
Note: The red line delineates the geographic boundaries established by the North American Bird Conservation Initiative for the BCRs. In this document, the boundaries of BCR 7 NL do not extend below the high-tide line.

The population of Newfoundland and Labrador is estimated at 512 659; however, only 30 760 (6%) reside in Labrador (NL Statistics Agency 2013). The largest urban centres in BCR 7 NL are the towns of Labrador City (7 367 residents), Wabush (1 861 residents) and Churchill Falls (650 residents), which are also the communities farthest inland in Atlantic Canada (NL Statistics Agency 2012; Vasseur and Catto 2008).

The regions included in BCR 7 NL are exposed to a subarctic climate characterized by relatively short and cool summers (mean temperatures of 6°C to 11°C) with prolonged periods of daylight, while winters are typically long, dry and cold (mean temperatures of -24.5°C to -11°C; North American Bird Conservation Initiative 2013). In addition, the Labrador Current transports cold water southward, and diminishes the moderating effect of the Atlantic Ocean. Annual precipitation ranges from 500 to 800 mm in western regions but can exceed 1000 mm in some areas along the coast (North American Bird Conservation Initiative 2013).

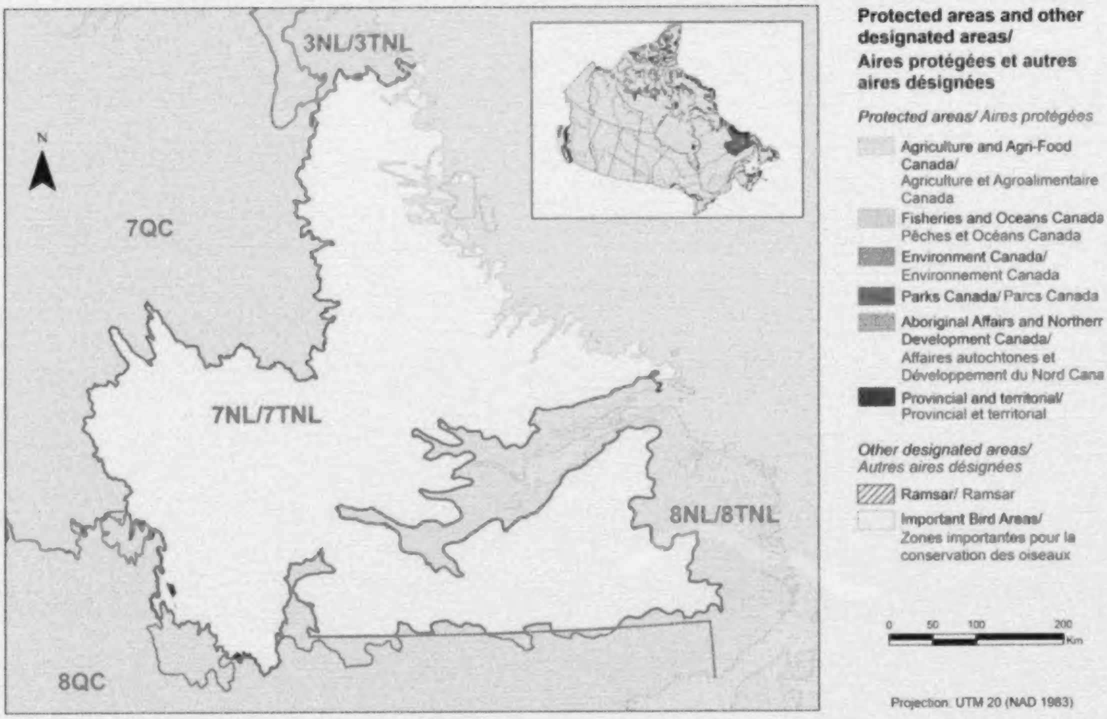
Hydroelectric power generation is one of the two main economic activities in BCR 7 NL. The Churchill Falls Generating Station located on the Churchill River provides hydroelectric resources to Labrador and Quebec as the second largest underground hydroelectric plant in North America with a generating capacity of 5 428 MW; it is also one of the largest underground powerhouses in the world (Nalcor Energy 2013a). In addition, the Lower Churchill

Project is currently developing the remaining potential of Muskrat Falls and Gull Island in order to supply an additional 3 000 MW of electricity to provincial consumers (Nalcor Energy 2013b).

The other main economic activity in BCR 7 NL is mineral exploitation. Mining is one of the largest and oldest industries in the province and a major contributor to the economy, as it accounted for 10.4% or $3.3 billion of the Gross Domestic Product (GDP) in 2011 (NL Department of Finance 2012). The metal operations in BCR 7 NL are located in Voisey's Bay for nickel, copper and cobalt; and in Labrador City/Wabush for iron ore and dolomite. The only non-metal operation is Labrador Iron Mines Holdings in Schefferville, also for iron ore. In addition, there are a number of exploration properties for nickel, rare earths, iron, uranium, vanadium, copper and gold throughout the region (NL Department of Natural Resources 2012a).

The Aboriginal peoples of Labrador include the Northern Inuit of Nunatsiavut, the Southern Inuit-Métis of NunatuKavut and the Innu (Aboriginal Affairs and Northern Development Canada 2009). The Inuit of Labrador are found in several regions on the north coast (i.e., Rigolet, Makkovik, Postville, administrative capitals of both Hopedale and Nain) and are direct descendants of the prehistoric Thule, hunters who spread from Alaska across the circumpolar regions of Canada and Greenland. In 2005, the Nunatsiavut Government was established as a regional government within the province of Newfoundland and Labrador (Nunatsiavut Government 2009). The Labrador Inuit-Metis are found in a number of communities on the central and southern coasts of Labrador (i.e., Happy Valley-Goose Bay, Mud Lake, North West River, Cartwright, Paradise River, Black Tickle, Norman Bay, Charlottetown, Pinsent's Arm, Williams Harbour, Port Hope Simpson, St. Lewis, Mary's Harbour and Lodge Bay), where a significant part of the population are derived from European white-Inuit intermarriage (NunatuKavut 2012). Nowadays, Inuit-Metis traditional fishing, hunting and trapping methods still resonate with a number of community members (Pastore, 1997). The Labrador Innu peoples occupy two settlements: Sheshatshiu, near Lake Melville, and Natuashish, along the northern coast. Many have retained their original languages and a portion of their nomadic ancient cultures (Innu Nation 2013).

Nearly 3.5% of Labrador's surface area (terrestrial: 9 893 km^2, marine: 83 km^2) is protected either provincially or federally (Canadian Council on Ecological Areas 2011; Fig. 2). There are no National Wildlife Areas or Migratory Bird Sanctuaries in BCR 7 NL. In 2008, Canada and the Government of Newfoundland and Labrador announced a commitment to establish a 10 700 km^2 national park reserve in the wilderness area of the Mealy Mountains in Labrador. Correspondingly, the province has also indicated its commitment to protect lands adjacent to this national park reserve with the creation of a waterway provincial park that will protect the Eagle River. Once agreements are reached with the province and Aboriginal groups, this national park reserve and adjacent waterway provincial park will form the largest protected area in Atlantic Canada (Parks Canada 2011).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Fisheries and Oceans Canada Pêches et Océans Canada
Environment Canada/ Environnement Canada
Parks Canada/ Parcs Canada
Aboriginal Affairs and Northern Development Canada/ Affaires autochtones et Développement du Nord Canada
Provincial and territorial/ Provincial et territorial
Other designated areas/ Autres aires désignées
Ramsar/ Ramsar
Important Bird Areas/ Zones importantes pour la conservation des oiseaux
0 50 100 200 Km
Projection: UTM 20 (NAD 1983)

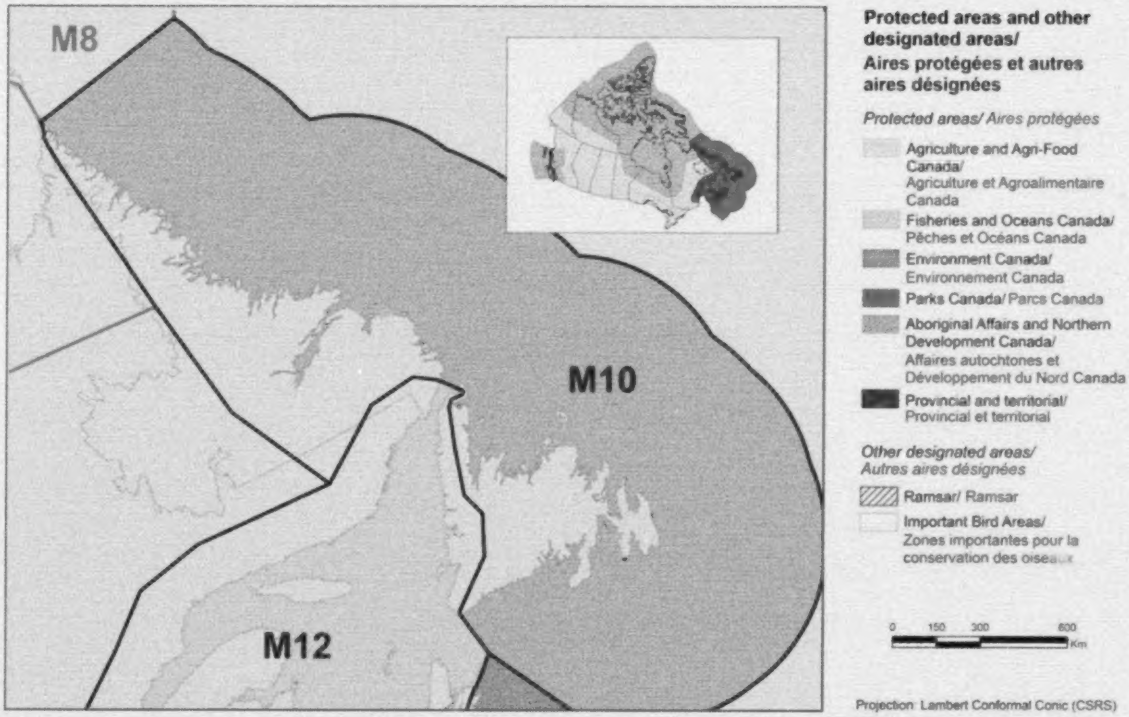
Figure 2. Map of protected and designated areas in BCR 7 NL.

The total land area of Newfoundland and Labrador is 404 517 km^2, of which 94% is owned by the Provincial Crown. As such, the majority of protected areas (in both numbers and total surface area) are provincially managed, including three terrestrial areas (193 km^2) and one marine area (24 km^2) in Labrador. There is also the Redfir Lake-Kapitagas Channel Ecological Reserve (82 km^2), divided into two parcels and located in southwestern Labrador (NL Department of Environment and Conservation 2013a). The Nature Conservancy of Canada is a non-governmental organization (NGO) engaged in securing and managing lands for conservation and is currently working in BCR 7 NL on a habitat conservation plan with communities, other environmental NGOs, universities, and the Nunatsiavut Government, the Innu Nation and NunatuKavut Community Council, along with federal and provincial governments. In addition, designations that recognize ecological uniqueness (but do not formally protect habitat) have elevated public awareness and promoted the conservation of ecologically significant habitats in BCR 7 NL. These include four Important Bird Areas (IBA Canada 2012): Northeast Groswater Bay (174 km^2), Nain coastline (1 428.66 km^2), offshore islands southeast of Nain (532 km^2) and Quaker Hat Island (33 km^2).

Characteristics of Marine Biogeographic Unit 10: Newfoundland-Labrador Shelves

The Newfoundland-Labrador Shelves (MBU 10, corresponding to M10 in Fig. 3) extend off the eastern coast of Canada into the Atlantic Ocean and encompass one of the largest areas of continental shelf in the world (Department of Fisheries and Oceans 2010). Extending from the northern tip of Labrador southwards to the Grand Banks off the island of Newfoundland, and bordered by the Canadian Exclusive Economic Zone, the total area of MBU 10 NL is greater than 2.5 million km^2 (Department of Fisheries and Oceans 2010). The Newfoundland-Labrador Shelves exhibit significant variation in seabed structure and are represented by extensive coastal forms, offshore banks, slopes and canyons (Department of Fisheries and Oceans 2010). The coastlines are continually modified by exposure to wave action, sea ice and fluctuating sea levels, with various elevation ranges from areas of low relief to steep cliffs, and consistent tidal ranges from 0.8 to 1.6 m (Templeman 2010). The continental shelf region is typically divided into three zones: (1) an inner shelf, a narrow zone parallel with the coast up to 20 km wide; (2) an inner-central shelf, consisting of a broad, fairly flat area, averaging 50–150 km in width, and ranging from 50–200m in depth; and (3) an outer shelf. The continental slope region lies beyond this continental shelf break, rapidly reaching depths of more than 3 000 m (Templeman 2010).

The waters off the Newfoundland-Labrador Shelves are mainly influenced by the Labrador Current that flows southward into inshore and offshore branches. The offshore branch originates from the West Greenland Current and borders the continental shelf and the Grand Banks. It transports 10 times more water than the inshore branch, in addition to being saltier and warmer (Rose 2007). The colder, fresher inshore branch originates in the Canadian High Arctic, receives freshwater input from rivers along its route, and hugs the northeast coast of Newfoundland and Labrador along the Avalon Channel, then turns west along the south coast of the island, penetrating Placentia Bay before entering the Gulf of St. Lawrence (Rose 2007). A small area of MBU 10 NL is covered in sea ice 7 to 10 months of the year. Icebergs are abundant and occur year-round. Most of these icebergs are produced by glaciers on the Greenland coast that are detached and transported northward in a counter-clockwise direction around Baffin Bay, then southward through the Davis Strait by the Labrador Current (Templeman 2010). The mixing of the Labrador Current with the warmer Gulf Stream, along with the shape of the ocean floor in MBU 10 NL, lifts nutrients to the surface, making these waters some of the most productive in the world (Department of Fisheries and Oceans 2010). The Newfoundland-Labrador Shelves support an impressive diversity of marine life given their temperate nature, including various species of cold-water corals, plankton, fish, mammals, amphibians and seabirds. In addition to the effects on nutrients, the mixing of the cold and warm currents often causes frequent and dense fog in the area, which is most common over the Grand Banks and along the southern and southeastern coasts of Newfoundland (Encyclopedia Britannica Online 2013). The waters of the Newfoundland-Labrador Shelves are also among the stormiest in North America (Templeman 2010).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Fisheries and Oceans Canada/ Pêches et Océans Canada
Environment Canada/ Environnement Canada
Parks Canada/ Parcs Canada
Aboriginal Affairs and Northern Development Canada/ Affaires autochtones et Développement du Nord Canada
Provincial and territorial/ Provincial et territorial
Other designated areas/ Autres aires désignées
Ramsar/ Ramsar
Important Bird Areas/ Zones importantes pour la conservation des oiseaux
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150
300
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Km
Projection: Lambert Conformal Conic (CSRS)

Figure 3. Map of protected and designated areas in MBU 10 NL (M10).

In MBU 10 NL, extensive offshore oil and gas exploration/extraction is proceeding in the Grand Banks region, and this industry accounted for approximately 33% ($10 350 billion) of the provincial GDP in 2011 (NL Department of Finance 2012). The province currently has three major oil fields: Hibernia, Terra Nova and White Rose. The Hebron field will be Newfoundland and Labrador's fourth stand-alone offshore oil project; development activities have been ongoing since 2008 and the first oil is expected in 2017 (NL Department of Finance 2012; NL Department of Natural Resources 2013c).

Grand Banks is also one of the richest fishing grounds in the world; therefore, the fishing industry remains an important part of the provincial economy. This industry, combined with hunting and trapping, contributes over $215 million to the GDP annually (NL Department of Finance 2012) with the combined harvest of both fish (such as cod, haddock, halibut and herring) and shellfish (such as crab, shrimp and clams; NL Department of Natural Resources 2013d). Aquaculture is also an important industry in the province, and all sites within MBU 10 NL are situated around the island of Newfoundland and very near the coastline, with the largest concentration located in the Bay d'Espoir region (Templeman 2010). The industry is focusing development efforts on Steelhead Trout, Atlantic Salmon, blue mussels and Atlantic Cod. Other species such as scallops and Arctic Char are also being investigated (Department of Fisheries and Oceans 2010; Newfoundland Aquaculture Industry Association 2011).

Marine transportation is an important component of the economy, as the major industries in MBU 10 NL are ocean-based (fisheries, oil and gas). The strategic location of this region on the Great Circle Route between eastern North America and Europe is important for domestic and international shipping, while the Cabot Strait links trans-Atlantic shipping routes to the St. Lawrence Seaway and the Great Lakes (Templeman 2010). On the island of Newfoundland, the major port that handles very large volumes of cargo (used mainly for the movement of oil) is Come By Chance in Placentia Bay. Other ports include Whiffen Head, Hibernia and Holyrood (Templeman 2010). The port of St. John's is also a major commercial port for shipments of consumer and industrial goods, while in Labrador, Happy Valley-Goose Bay is the central hub (Transport Canada 2012). In addition to large cargo vessels, the marine transportation sector includes ferries, tugs/barges, recreational boating, and cruise ship traffic. Several smaller ferries connect numerous other coastal towns and offshore island communities around the island of Newfoundland and up the Labrador coast. Inter-provincial ferry services operate auto-passenger ferries from North Sydney (NS) to the towns of Port aux Basques and Argentia on the southern coast of the island of Newfoundland (NL Department of Transportation and Works 2012). Tug and barge activities and recreational boating are also common, and tend to be restricted to coastal, inland and harbour waters (Cruiseship Authority of Newfoundland and Labrador 2013).

MBU 10 NL contains two important Marine Protected Areas representing 0.44% of the total area (Fig. 3). The Department of Fisheries and Oceans is responsible for the Eastport Marine Protected Area (3 km^2) in Bonavista Bay on the island of Newfoundland. In addition, the Laurentian Channel between the provinces of Nova Scotia and Newfoundland and Labrador is considered a potential future Marine Protected Area (Department of Fisheries and Oceans 2012). There is one important Marine Protected Area in Labrador: Gilbert Bay Marine Protected Area (59 km^2), managed by the Department of Fisheries and Oceans. There are also numerous ecological reserves in MBU 10 NL including the Gannet Islands Ecological Reserve (24 km^2), which is managed provincially and protects the largest and most diverse seabird colonies (Razorbills, Atlantic Puffins, Common and Thick-billed Murres, Black-legged Kittiwakes, Great Black-backed Gulls and Northern Fulmars) in North America. Other important seabird ecological reserves in MBU 10 NL include Baccalieu Island, Cape St-Mary's, Funk Island, Witless Bay, Hare Bay Islands and Lawn Islands Archipelago Provisional (NL Department of Environment and Conservation 2013a).

Section 1: Summary of Results – All Birds, All Habitats

Element 1: Priority Species Assessment

These Bird Conservation Strategies identify "priority species" from all regularly occurring bird species in each BCR subregion (see Appendix 1). Species that are vulnerable due to population size, distribution, population trend, abundance and threats are included because of their "conservation concern". Some widely distributed and abundant "stewardship" species are also included. Stewardship species are included because they typify the national or regional avifauna and/or because they have a large proportion of their range and/or continental population in the subregion; many of these species have some conservation concern, while others may not require specific conservation effort at this time. Species of management concern are also included as priority species when they are at (or above) their desired population objectives but require ongoing management because of their socio-economic importance as game species or because of their impacts on other species or habitats (see Appendix 2).

The purpose of the prioritization exercise is to focus implementation efforts on the issues of greatest significance for Canadian avifauna. Table 1 provides a full list of all priority species and their reason for inclusion in BCR 7 NL and MBU 10 NL. Tables 2 and 3 summarize the number of priority species in BCR 7 NL and MBU 10 NL by bird group and by the reason for priority status.

In BCR 7 NL, there are 36 priority species (Table 2), most of which are landbirds (18 species). There are also 6 shorebirds, 3 waterbirds and 9 waterfowl species. Overall, 45% of waterfowl and 30% of shorebirds are priority bird species, compared with 27% of waterbirds and 25% of landbirds (Table 2). There are 6 (17%) priority species that are formally protected under the Government of Canada's *Species at Risk Act* (Species at Risk Public Registry 2012); all are landbirds (Table 3).

In MBU 10 NL, there are 39 priority species (Table 2): 1 landbird, 8 shorebirds, 18 waterbirds and 12 waterfowl species. Overall, 50% of waterfowl and 41% of waterbirds are priority bird species compared with 31% of shorebirds and 25% of landbirds. There are 5 (13%) priority species that are formally protected under the Government of Canada's *Species at Risk Act* (Species at Risk Public Registry 2012): 2 shorebirds, 1 waterbird, and 2 waterfowl (Table 3).

In both BCR 7 and MBU 10 NL, priority status was most frequently attributed to landbirds due to regional concern or due to their status as stewardship species, whereas shorebirds and waterbirds tended to obtain priority status due to national or continental-level concern (Table 3). This is primarily due to a lack of information at the regional level for many of the shorebird and waterbird species. The primary reason for the priority status of waterfowl in this strategy was a ranking of moderately high, high or highest under the North American Waterfowl Management Plan (NAWMP Plan Committee 2004; Table 3).

Table 2. Summary of priority species, by bird group, in BCR 7 NL and MBU 10 NL.

Bird Group	Total Species (% of avifauna)	Total Priority Species	Percent Listed as Priority	Percent of Priority List
BCR 7 NL				
Landbirds	73 (59%)	18	25%	50%
Shorebirds	20 (16%)	6	30%	17%
Waterbirds	11 (9%)	3	27%	8%
Waterfowl	20 (16%)	9	45%	25%
Total	**124**	**36**	**29%**	**100%**
MBU 10 NL				
Landbirds	4 (4%)	1	25%	3%
Shorebirds	26 (27%)	8	31%	20%
Waterbirds	44 (45%)	18	41%	46%
Waterfowl	24 (24%)	12	50%	31%
Total	**98**	**39**	**40%**	**100%**

Table 3. Number of priority species in BCR 7 NL and MBU 10 NL by reason for priority status.

Reasons for Priority Listing[1]	Landbirds	Shorebirds	Waterbirds	Waterfowl
BCR 7 NL Total	**18**	**6**	**3**	**9**
COSEWIC[2]	5	0	0	1
Federal SARA-listed[3]	5	0	0	1
Provincial SAR-listed[4]	6	0	0	1
NAWMP[5]	–	–	–	9
National/Continental Concern	7	5	3	7
Regional/Subregional Concern	0	0	0	–
National/Continental Stewardship	10	–	–	–
Regional/Subregional Stewardship	12	4	1	5
Added during expert reviews[6]	0	0	0	0
MBU 10 NL Total	**1**	**8**	**18**	**12**
COSEWIC[2]	0	2	1	2
Federal SARA-listed[3]	0	2	1	2
Provincially listed[4]	0	2	1	2
NAWMP[5]	–	–	–	12
National/Continental Concern	0	7	13	10
Regional/Subregional Concern	0	–	4	–
National/Continental Stewardship	1	–	2	–
Regional/Subregional Stewardship	0	0	3	2
Added during expert reviews[6]	0	1	2	0

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[1] A single species can be on the priority list for more than one reason. Note that not all reasons for inclusion apply to every bird group (indicated by "-").

[2] COSEWIC indicates species assessed by the Committee on the Status of Endangered Wildlife in Canada as Endangered, Threatened or Special Concern (COSEWIC 2012).

[3] Species listed on Schedule 1 of *the Species at Risk Act* as Endangered, Threatened or Special Concern (Species at Risk Public Registry 2012).

[4] Species listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened or Vulnerable (NL Department of Environment and Conservation 2013b).

[5] Waterfowl identified as "key species" for Newfoundland and Labrador in the Eastern Habitat Joint Venture Implementation Plan (EHJV 2008), and/or scored as "Moderately-High", "High" or "Highest" in either breeding or non-breeding conservation and/or monitoring needs for waterfowl conservation region 7 (analogous to BCR 7) of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).

[6] Species added by the NL Technical Working Group.

Element 2: Habitats Important to Priority Species

Identifying the broad habitat requirements for each priority species within the BCR and the MBU allowed species to be grouped by shared habitat-based conservation issues and actions (see Appendix 2 for details on how species were assigned to standard habitat categories). If many priority species associated with the same habitat face similar conservation issues, then conservation action in that habitat may support populations of several priority species. BCR strategies use a modified version of the standard land-cover classes developed by the United Nations (Food and Agriculture Organization 2000) to categorize habitats, and species were often assigned to more than one habitat class.

The assignment of habitat associations for priority bird species was done through literature review and expert consultation. For each priority species in BCR 7 NL and MBU 10 NL, all of their known habitat associations were considered, not just the primary habitat associations (see Table A-2 for a complete list of those habitat associations). Because of variability in the quantity and availability of information related to species-habitat associations, quantifying the relative importance of any given habitat was not possible. In this document, statements regarding the importance of habitat types for priority bird species are related to the number of priority birds associated with each habitat and may not reflect the overall importance of the habitat to all bird species in the planning unit. For instance, herbaceous habitat is a dominating landscape feature in BCR 7 NL (Fig. 1); however, there are only two priority bird species (5%) associated with this habitat (Fig. 4).

Though wetlands are not as common on the landscape as some other habitat classes in BCR 7 NL, wetlands are used by the greatest number of priority bird species (19 species; Fig. 4). Coastal habitat (above high tide) and coniferous forests are also important habitats as they are used by 15 and 14 priority species, respectively. Herbaceous, lichens/mosses and urban habitats are used by the fewest number of priority bird species (two species each; Fig. 4).

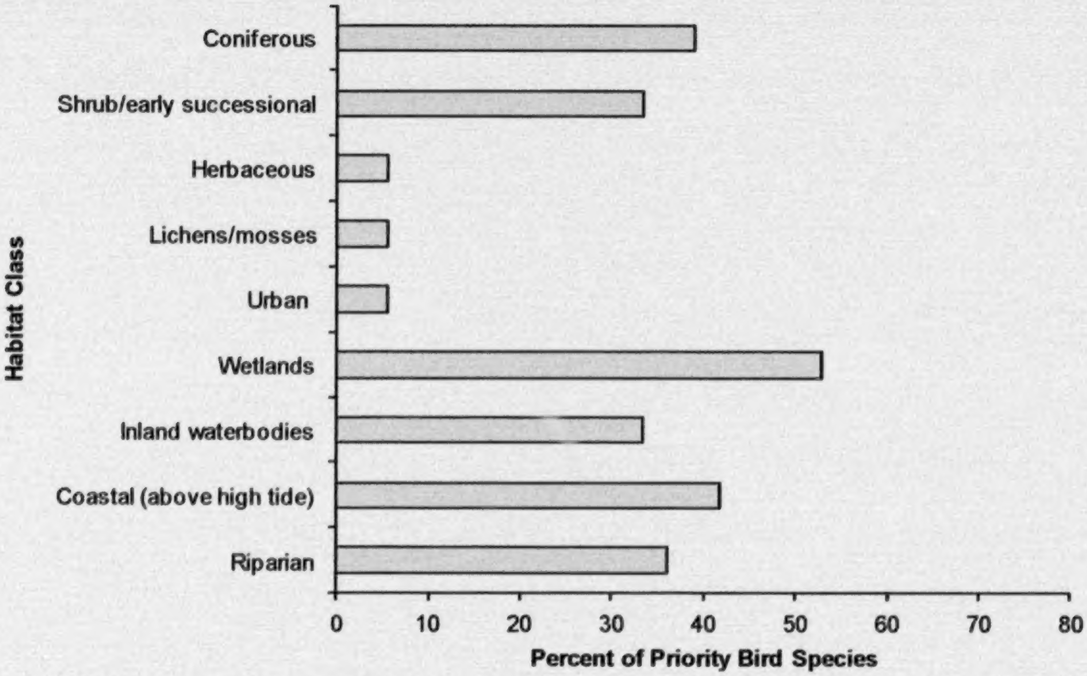

Figure 4. Percent of priority species that are associated with each habitat class in BCR 7 NL.
Note: The total exceeds 100% because each species may be assigned to more than one habitat.

There are only two habitat classes in MBU 10 NL: coastal (intertidal) and marine waters (which include nearshore waters and continental shelf). In MBU 10 NL, there are 28 priority bird species associated with the intertidal coast, while 30 priority bird species are found in marine waters (Fig. 5).

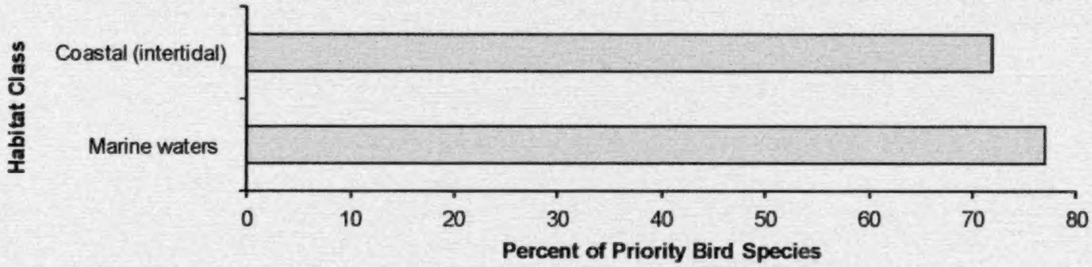

Figure 5. Percent of priority species that are associated with each habitat class in MBU 10 NL.
Note: The total exceeds 100% because each species may be assigned to more than one habitat.

Element 3: Population Objectives

Population objectives allow us to measure and evaluate conservation success. The objectives in this strategy are assigned to categories and are based on a quantitative or qualitative assessment of species' population trends. If the population trend of a species is unknown, the objective is set as "assess and maintain", and a monitoring objective is given (see Appendix 2). For any species listed under the *Species at Risk Act* (SARA) or under provincial/territorial endangered species legislation, Bird Conservation Strategies defer to population objectives in available recovery documents. The ultimate measure of conservation success will be the extent to which population objectives have been reached over the next 40 years. Population objectives do not currently factor in feasibility of achievement, but are held as a standard against which to measure progress.

In BCR 7 NL, the population objective for 15 priority bird species (42%) is to maintain current levels, an indication that population trends for these species are stable (Fig. 6). They are, however, still considered priorities due to factors such as national/continental and regional/sub-regional concern or stewardship status (Table 1). Eighteen priority bird species (50%) have a population objective of "assess/maintain", which indicates that there is insufficient data to reliably assess a trend; therefore, additional monitoring is required for these species (Fig. 6). There are three priority bird species (8%) with identified population declines and for which the objective is to increase population size by 50% or 100% (Fig. 6). The Canada Goose (North Atlantic) and Green-winged Teal both have a population objective to increase by 50%, while the Ring-necked Duck has an Eastern Habitat Joint Venture (EHJV) objective to increase by 100% (Fig. 6; Table 1). Recovery documents for the six SARA-listed species in BCR 7 NL have not yet been completed, therefore interim objectives for those species are included in this strategy, with the understanding that these will be replaced once the recovery and management objectives have been finalized.

In MBU 10 NL, there are insufficient data to reliably assess a trend for the majority of priority species (29 species, 74%); therefore their population objectives are to "assess/maintain" (Fig. 7). Six priority species (15%) have a population objective of "maintain current", while four priority species (10%) have identified population declines and were given population objectives to either recover or increase population size by 50% or 100%. The Piping Plover (*melodus*) and Ivory Gull have specific recovery objectives described in their respective SARA Recovery Strategies (Table 1). The Canada Goose (North Atlantic) has a population objective to increase by 50% while the Common Eider has an EHJV objective to increase by 100% (Fig. 7).

Table 1. Priority bird species in BCR 7 NL and MBU 10 NL, population objective, and the reason for priority status.

Note: A "Y" in the first two columns indicates a priority species occurrence within the planning unit; it also indicates the reason for inclusion as a priority listing.

BCR 7 NL	MBU 10 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[3]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
Y		American Three-toed Woodpecker	Landbirds	Maintain current							Y		
Y		Black-backed Woodpecker	Landbirds	Maintain current					Y		Y		
Y		Boreal Chickadee	Landbirds	Maintain current					Y				
Y		Common Nighthawk	Landbirds	Assess/Maintain†	TH	TH	TH	Y					
Y		Gray Jay	Landbirds	Maintain current					Y				
Y		Gray-cheeked Thrush	Landbirds	Assess/Maintain			VU						
Y		Gyrfalcon	Landbirds	Maintain current					Y		Y		
Y		Merlin	Landbirds	Maintain current							Y		
Y		Northern Hawk Owl	Landbirds	Maintain current							Y		
Y		Northern Shrike	Landbirds	Maintain current					Y		Y		

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[1] Population objectives apply in all units where the species is priority (BCR 7 NL and/or MBU 10 NL) unless otherwise indicated.

[2] Species listed on Schedule 1 under the *Species at Risk Act* as Endangered (EN), Threatened (TH) or Special Concern (SC) (Species at Risk Public Registry 2012).

[3] Species assessed by the Committee on the Status of Endangered Wildlife in Canada as Endangered (EN), Threatened (TH) or Special Concern (SC; COSEWIC 2012).

[4] Species listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered (EN), Threatened (TH) or Vulnerable (VU) (NL Department of Environment and Conservation 2013b).

[5] Waterfowl identified as "key species" in the Eastern Habitat Joint Venture Implementation Plan 2007–2012 (EHJV 2008), and/or scored as "Moderately-High", "High" or "Highest" " in either breeding or non-breeding conservation and/or monitoring needs for waterfowl conservation region 7 (analogous to BCR 7) of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).

[6] Species added by the NL Technical Working Group.

† This interim population objective will be replaced once recovery documents for this SARA-listed species are published.

Table 1 continued

BCR 7 NL	MBU 10 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[3]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
Y		Olive-sided Flycatcher	Landbirds	Assess/Maintain†	TH	TH	TH	Y					
Y		Palm Warbler	Landbirds	Maintain current				Y	Y		Y		
Y		Peregrine Falcon (*anatum/tundrius*)	Landbirds	Assess/Maintain†	SC	SC	VU		Y				
Y		Pine Grosbeak	Landbirds	Maintain current				Y	Y		Y		
Y		Rough-legged Hawk	Landbirds	Maintain current					Y		Y		
Y		Rusty Blackbird	Landbirds	Maintain current†	SC	SC	VU	Y			Y		
Y		Short-eared Owl	Landbirds	Assess/Maintain†	SC	SC	VU	Y			Y		
	Y	Snowy Owl	Landbirds	Maintain current					Y				
Y		Swamp Sparrow	Landbirds	Maintain current				Y	Y		Y		
Y		American Golden-Plover	Shorebirds	Assess/Maintain				Y			Y		
Y		Least Sandpiper[7]	Shorebirds	Assess/Maintain				Y					
	Y	Lesser Yellowlegs	Shorebirds	Assess/Maintain				Y					
	Y	Piping Plover (*melodus*)	Shorebirds	Recovery objective	EN	EN	EN	Y					
	Y	Purple Sandpiper	Shorebirds	Assess/Maintain				Y					
	Y	Red Knot (*rufa*)	Shorebirds	Assess/Maintain†	EN	EN	EN	Y					
	Y	Sanderling	Shorebirds	Assess/Maintain				Y					
Y		Semipalmated Sandpiper	Shorebirds	Assess/Maintain				Y			Y		

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[7] The shorebird priority species were selected based on Andres 2009. A recent assessment (Andres et al. 2012) now suggests that the populations of the Least Sandpiper and Solitary Sandpiper are stable. Subsequent database versions will be modified to account for this new information.

Table 1 continued

BCR 7 NL	MBU 10 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[3]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
Y	Y	Solitary Sandpiper[7]	Shorebirds	Assess/Maintain				Y					
Y	Y	Whimbrel	Shorebirds	Assess/Maintain				Y			Y		
	Y	White-rumped Sandpiper	Shorebirds	Maintain current									Added
Y		Wilson's Snipe	Shorebirds	Assess/Maintain							Y		
	Y	Atlantic Puffin	Waterbirds	Maintain current									Added
	Y	Black-legged Kittiwake	Waterbirds	Maintain current					Y		Y		Added
Y	Y	Common Loon	Waterbirds	Assess/Maintain				Y			Y		
	Y	Common Murre	Waterbirds	Assess/Maintain				Y					
Y	Y	Common Tern	Waterbirds	Assess/Maintain				Y					
	Y	Cory's Shearwater	Waterbirds	Assess/Maintain				Y					
	Y	Dovekie	Waterbirds	Assess/Maintain						Y			
	Y	Great Shearwater	Waterbirds	Assess/Maintain						Y			
	Y	Great Skua	Waterbirds	Assess/Maintain				Y					
	Y	Ivory Gull	Waterbirds	Recovery objective	EN	EN	EN	Y					
	Y	Leach's Storm-Petrel	Waterbirds	Assess/Maintain				Y		Y			
	Y	Manx Shearwater	Waterbirds	Assess/Maintain				Y					
	Y	Northern Gannet	Waterbirds	Maintain current					Y		Y		
	Y	Razorbill	Waterbirds	Assess/Maintain						Y			
	Y	Red-necked Grebe	Waterbirds	Assess/Maintain				Y		Y			
Y	Y	Red-throated Loon	Waterbirds	Assess/Maintain				Y					
	Y	Sooty Shearwater	Waterbirds	Assess/Maintain				Y					

Table 1 continued

BCR 7 NL	MBU 10 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[2]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
	Y	Thick-billed Murre	Waterbirds	Assess/Maintain				Y					
Y	Y	American Black Duck	Waterfowl	Maintain current				Y				EHJV, NAWMP	
	Y	Barrow's Goldeneye (Eastern)[8]	Waterfowl	Assess/Maintain[7]	SC	SC	VU	Y				EHJV, NAWMP	
Y	Y	Black Scoter	Waterfowl	Assess/Maintain				Y			Y	NAWMP	
Y	Y	Canada Goose (North Atlantic)	Waterfowl	Increase 50%				Y				EHJV, NAWMP	
	Y	Common Eider	Waterfowl	Increase 100%				Y				EHJV, NAWMP	
Y	Y	Common Goldeneye	Waterfowl	Maintain current (BCR 7 NL) Assess/Maintain (MBU 10 NL)				Y			Y	EHJV, NAWMP	
	Y	Common Merganser	Waterfowl	Assess/Maintain							Y	NAWMP	
Y		Green-winged Teal	Waterfowl	Increase 50%								EHJV	
Y	Y	Harlequin Duck (Eastern)	Waterfowl	Assess/Maintain	SC	SC	VU	Y				EHJV, NAWMP	
	Y	King Eider	Waterfowl	Assess/Maintain				Y				NAWMP	
Y	Y	Long-tailed Duck	Waterfowl	Assess/Maintain				Y			Y	EHJV, NAWMP	
Y		Ring-necked Duck	Waterfowl	Increase 100%							Y	EHJV	
Y	Y	Surf Scoter	Waterfowl	Assess/Maintain				Y			Y	EHJV, NAWMP	
	Y	White-winged Scoter	Waterfowl	Assess/Maintain				Y				NAWMP	

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[8] Assessment of priority bird species was conducted prior to telemetry research indicating that the Barrow's Goldeneye (Eastern) uses many stopover sites within BCR 7 during migration and is subjected to population declines.

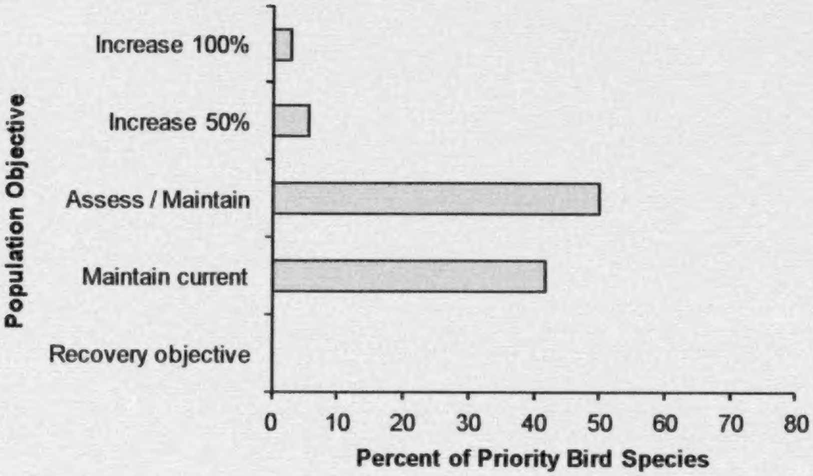


Figure 6. Percent of priority species that are associated with each population objective category in BCR 7 NL.

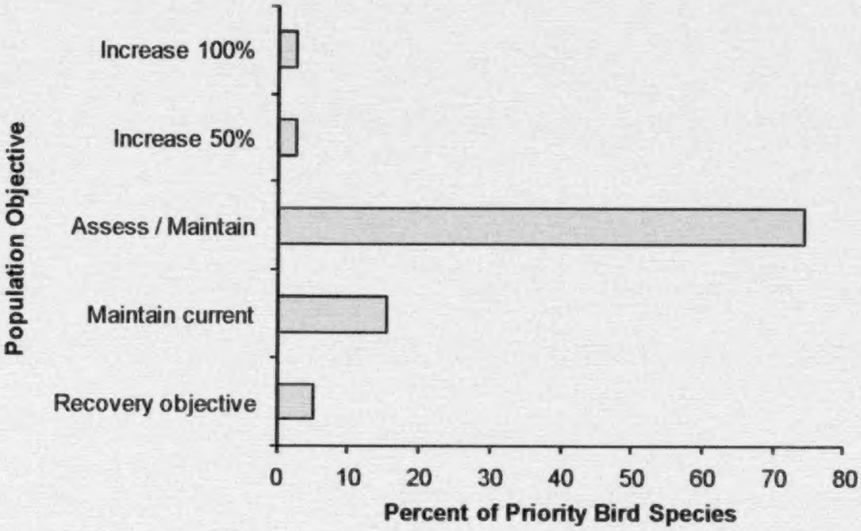


Figure 7. Percent of priority species that are associated with each population objective category in MBU 10 NL.

Element 4: Threat Assessment for Priority Species

The threats assessment process (see Appendix 2) identifies threats believed to have a population-level effect on individual priority species. These threats are assigned a relative magnitude (Low, Medium, High, Very High), based on their scope (the proportion of the species' range within the affected subregion) and severity (the relative impact on the priority species' population). This allows us to target conservation actions towards threats with the greatest effects on suites of species or in broad habitat classes. Some well-known conservation issues (such as predation by domestic cats or climate change) may not be identified in the literature as significant threats to populations of an individual priority species and therefore may not be captured in the threat assessment. However, they merit attention in conservation strategies because of the large numbers of individual birds affected in many regions of Canada. We have incorporated them in a separate section on Widespread Issues, but unlike other threats, they are not ranked. In BCR 7 NL and MBU 10 NL, a category was added to the threats classification scheme to allow for the inclusion of inadequate monitoring or research information (category 12 "Other direct threats" and sub-category 12.1 "Information lacking"). The following discussion focuses mainly on the highest-ranked threats and notes a few medium- and low-ranked threats where appropriate.

A complete list of threats to priority species in each planning unit is included in Appendix 1 (see Table A-3). Some of the threats identified are not unique to a particular planning unit or a type of habitat (for example, mortality due to collisions with moving vehicles) while others are specific (for example, habitat loss due to tourism and recreational housing development in coastal habitats). These threats are categorized according to Salafsky et al. 2008 (see Table A-4 in Appendix 3 for a complete list of threat categories).

Once individually ranked threats to priority species were rolled up for each habitat class in both planning units, the overall threat magnitude was found to be "high" for the shrub/early successional, wetland and coastal (above high tide) habitats in BCR 7 NL, as well as the intertidal coastal and marine waters of MBU 10 NL. The remaining habitat classes have an overall threat magnitude of "medium", except for the herbaceous and urban habitats in BCR 7 NL, which have a threat magnitude of "low" (Table 4).

In BCR 7 NL, several high-ranked threats were identified, including habitat loss or degradation from changes in habitat structure (e.g., drying, thawing of tundra) or food webs, shifts in species' ranges, and altered timing of seasonal cues (e.g., egg laying, migration) due to climate change (11.1 Habitat shifting & alteration), in all habitats except herbaceous (Fig. 8). Gaps in knowledge of priority bird species' distribution, abundance and trends (12.1 Information lacking) were found in all habitats except urban. Medium-ranked threats also related to climate change, including mortality due to thermal stress or temperature extremes (11.3. Temperature extremes), were found in all habitats except lichens/mosses, herbaceous and inland waterbodies. Habitat degradation or mortality due to increased frequency and severity of storms (11.4 Storms and flooding) was found in coniferous forest, urban, wetland, coastal (above high tide) and riparian habitats. Another threat that was frequently identified but ranked as having "low" overall magnitude was mortality due to legal hunting or poaching and incidental take (5.1 Hunting & collecting of terrestrial animals; Fig. 8) in all habitats but herbaceous. While mining and resource extraction is considered an important and currently expanding economic activity, at the time of threat assessment there was little information found regarding the direct effects of prospecting and staking properties, or other direct threats to priority species related to the mining industry. However, these activities might have a large disturbance footprint on the landscape, especially with respect to noise and the air traffic in the area.

In MBU 10 NL, several high-ranked threats were identified, including habitat degradation, lethal and/or sublethal effects due to chemical or heavy metal contamination, especially from oil spills and discharges by ships or drilling platforms (9.2 Industrial & military effluents), as well as gaps in knowledge of the distribution, abundance and trends of priority bird species (12.1 Information lacking) in both coastal (intertidal) habitats and marine waters (Fig. 9). Medium-ranked threats to priority species in MBU 10 NL include mortality from entanglement in fishing gear and habitat degradation from competition with commercial fisheries for prey in marine waters (5.4 Fishing & harvesting aquatic resources). Climate change also resulted in habitat degradation due to changes to habitat structure and food webs (11.1 Habitat shifting & alteration) as well as changes to the formation, distribution and thickness of sea ice (11.3 Temperature extremes). Finally, additional medium-ranked threats in MBU 10 NL were reductions in survival or fecundity from the hybridization of American Black Ducks with Mallards, and increases in predator populations due to anthropogenic land modifications (8.2 Problematic native species) in coastal (intertidal) habitats (Fig. 9).

Threats to priority species while they are outside Canada during the non-breeding season were also assessed and are presented in the Threats Outside Canada section.

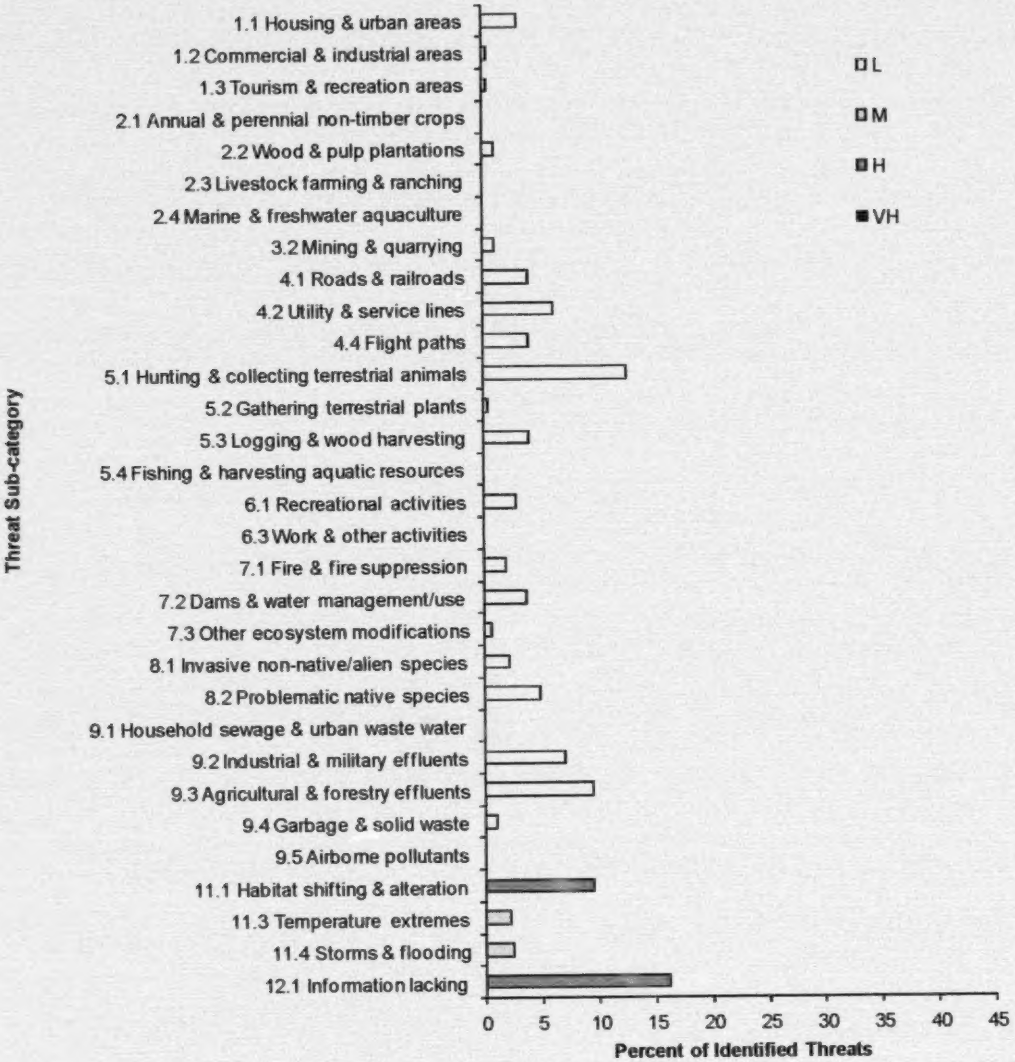


Figure 8. Percent of identified threats to priority species within BCR 7 NL by threat sub-category. Each bar represents the percent of the total number of threats identified for each sub-category in BCR 7 NL (for example, if 100 threats were identified in total for all priority species in BCR 7 NL, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). Shading in the bars (VH = very high, H = high, M = medium and L = low) represents the rolled-up magnitude of all threats in each threat sub-category in the BCR (see Appendix 2 for details on the assessment of magnitude).

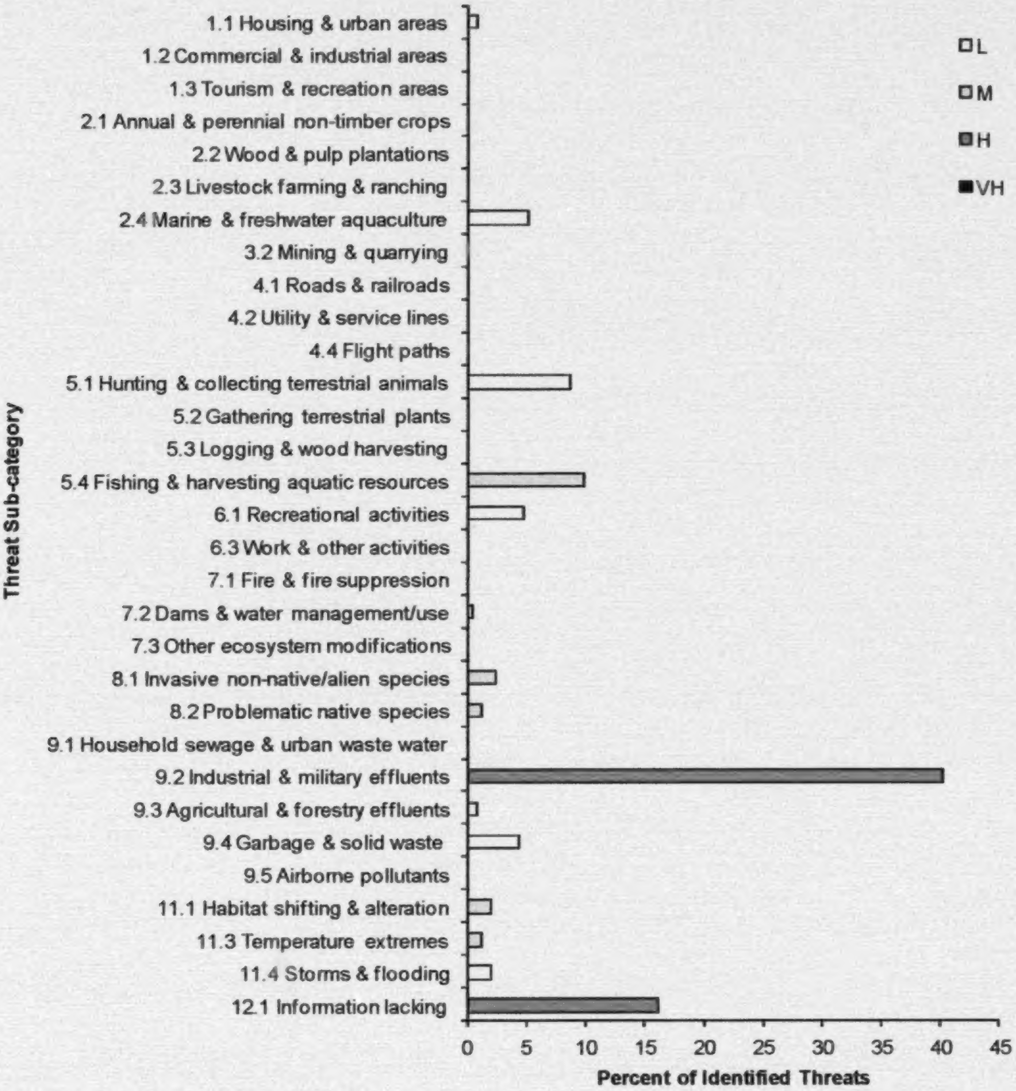


Figure 9. Percent of identified threats to priority species within MBU 10 NL by threat sub-category. Each bar represents the percent of the total number of threats identified for each sub-category in MBU 10 NL (for example, if 100 threats were identified in total for all priority species in MBU 10 NL, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). Shading in the bars (VH = very high, H = high, M = medium and L = low) represents the rolled-up magnitude of all threats in each threat sub-category in the MBU (see Appendix 2 for details on the assessment of magnitude).

Element 5: Conservation Objectives

Conservation objectives were designed to address threats and information gaps that were identified for priority species. They describe the environmental conditions and research and monitoring that are thought to be necessary for progress towards population objectives and to understand underlying conservation issues for priority bird species. As conservation objectives are reached, they will collectively contribute to achieving population objectives. Whenever possible, conservation objectives were developed to benefit multiple species and/or respond to more than one threat (see Appendix 2).

In BCR 7 NL, the most commonly identified conservation objective was improving our understanding of priority bird species, and the second most commonly identified objective was reducing mortality or increasing productivity of priority bird species (Fig. 10). In MBU 10 NL, these two objectives were also the most commonly identified; however, their relative importance was reversed (Fig. 11). This is consistent with the fact that for the majority of priority bird species in both BCR 7 NL and MBU 10 NL, we do not have enough information on population trends to set specific population objectives.

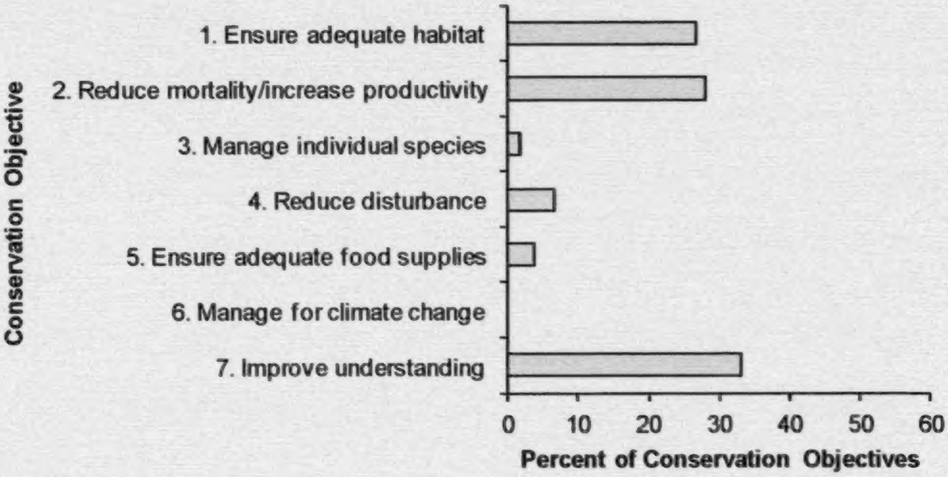


Figure 10. Percent of all conservation objectives assigned to each conservation objective category in BCR 7 NL.

Note: Widespread issues (including climate change) were excluded from this calculation, as they are discussed in Section 3: Additional Issues.

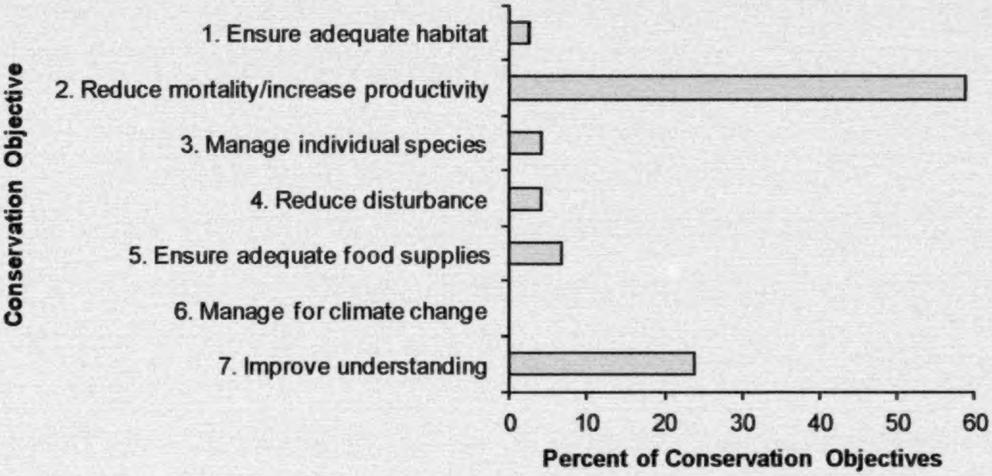


Figure 11. Percent of all conservation objectives assigned to each conservation objective category in MBU 10 NL.

Note: Widespread issues (including climate change) were excluded from this calculation, as they are discussed in Section 3: Additional Issues.

Element 6: Recommended Actions

Recommended actions indicate on-the-ground activities that will help to achieve the conservation objectives (Figs. 12, 13). Actions are strategic rather than highly detailed and prescriptive (see Appendix 2). Whenever possible, recommended actions benefit multiple species and/or respond to more than one threat. Recommended actions defer to or support those provided in recovery documents for species at risk at the federal, provincial or territorial level, but will usually be more general than those developed for individual species.

The recommended conservation actions are classified following the categories developed by the International Union for Conservation of Nature-Conservation Measures Partnership (IUCN-CMP) with the addition of categories for research and monitoring (see Table A-5 in Appendix 3 for a complete list of conservation action categories). In BCR 7 NL, the most frequently recommended conservation actions were not assigned to a sub-category, as they were related to widespread issues such as climate change and a lack of information (see Section 3: Additional Issues for more information). The most frequently identified conservation actions for more specific threats fell under the sub-category 2.1 Site/area management (Fig. 12). Examples of these actions include: establishing buffer zones around known breeding, foraging and/or staging areas in habitats while limiting industrial activities within the established buffers; maintaining sufficient patch sizes, configuration and connectivity of habitats to support and, where necessary, enhance populations of priority species; managing forests to promote features such as large trees, large snags and closed canopy; limiting human recreational activities in important breeding colony and stopover areas during breeding and migration windows; limiting sources of loud noise and rapidly moving vehicles in sensitive areas during breeding and migration windows; and limiting aircraft traffic, if possible, above sensitive habitats during overwintering, breeding and migration periods (see Section 2 for more habitat-specific examples).

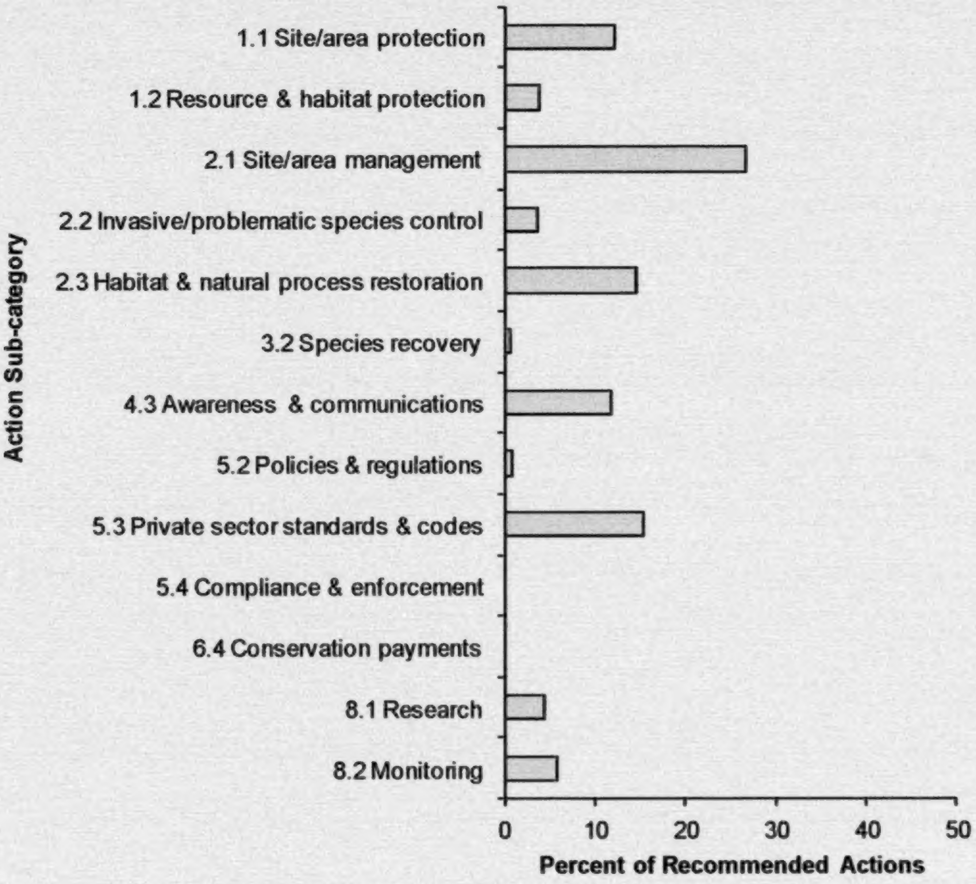


Figure 12. Percent of recommended actions assigned to each sub-category in BCR 7 NL.
Note: 8.1 Research and 8.2 Monitoring sub-categories refer to specific species where additional information is required. For a discussion of broad-scale research and monitoring requirements, see Research and Population Monitoring Needs in Section 3. For information on threats related to widespread issues (e.g., climate change), see Section 3.

In MBU 10 NL, the most frequently identified conservation actions fell under the sub-categories 2.3 Habitat and natural process restoration and 5.2 Policies and regulations (Fig. 13). Examples of actions under the former are to maintain/restore or improve water quality in marine waters by reducing the use of pollutants or heavy metals leaching into the environment, to maintain/improve effectiveness of emergency intervention programs such as those run by the Regional Environmental Emergencies, to maintain/improve Environment Canada's Birds Oiled at Sea (BOAS) program, and to recover and dispose of derelict fishing gear or garbage and solid wastes in marine waters and coastal (intertidal) habitats (see Section 2 for more habitat-specific examples). Examples of policies and regulations (sub-category 5.2) that are recommended include making, implementing, changing, influencing or providing input into policies and regulations affecting the implementation of laws at international, national, state/provincial, local and Aboriginal levels. For example, this may include altering fishing practices to avoid important foraging/staging areas during periods of peak bird use, regulating the adoption of fishing gear modifications to reduce bycatch as a condition of licensing, and prohibiting disposal of garbage and solid wastes in marine waters or coastal (intertidal) habitats through regulation (see Section 2 for more habitat-specific examples).

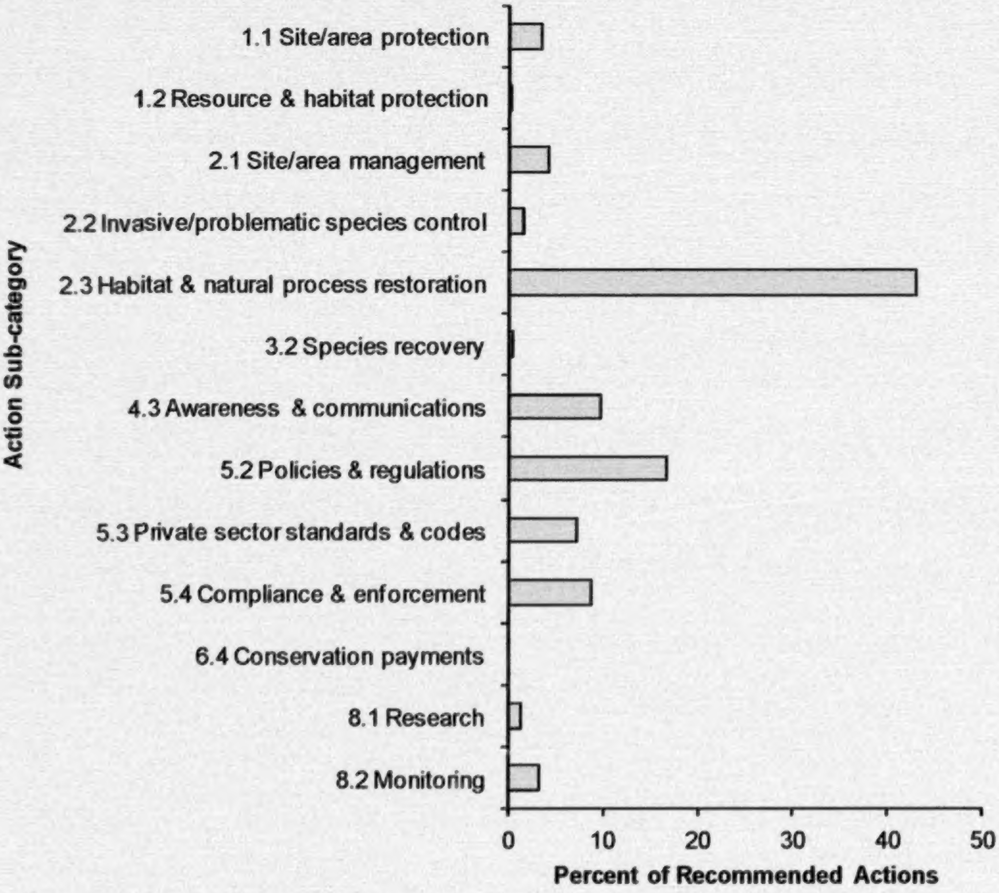


Figure 13. Percent of recommended actions assigned to each sub-category in MBU 10 NL.

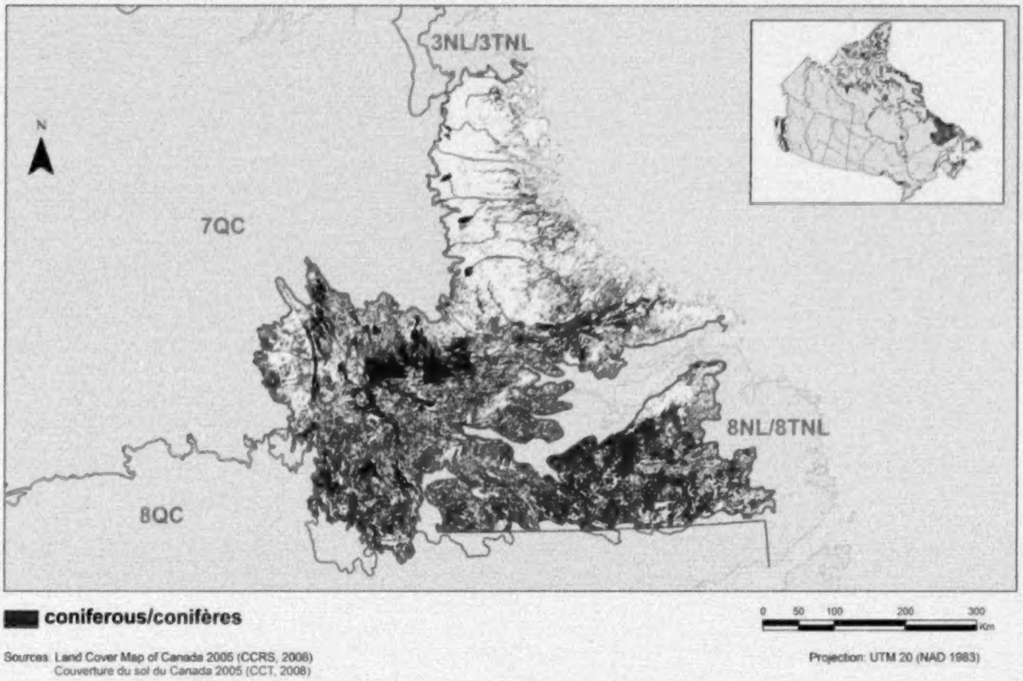
Note: 8.1 Research and 8.2 Monitoring sub-categories refer to specific species where additional information is required. For a discussion of broad-scale research and monitoring requirements, see Research and Population Monitoring Needs in Section 3. For information on threats related to widespread issues (e.g., climate change), see Section 3.

Section 2: Conservation Needs by Habitat

The following sections provide more detailed information on priority species, their threats and objectives within each of the broad habitat classes that occur in BCR 7 NL and MBU 10 NL. Where appropriate, habitat information is provided at a finer scale than the broad habitat categories in order to coincide with other land management exercises in the region. Some species do not appear in the threats table because their low-level threats have not been assigned objectives or actions and/or identified threats are addressed in the Widespread Issues section of the strategy.

Coniferous

In BCR 7 NL, coniferous habitats cover the majority of the area and are characterized by young and/or mature stands of cone-producing trees (Fig. 14). The variety of species is quite limited in this habitat class due to cool, moist climates, slow nutrient cycling and poorly drained soils (NL Department of Natural Resources 2012b). The dominant canopy species are black spruce (*Picea mariana*), which forms about two-thirds of coniferous forests in Labrador, and balsam fir (*Abies balsamea)*, which covers the remaining area (NL Department of Natural Resources 2012b).



Sources: Land Cover Map of Canada 2005 (CCRS, 2008)
Couverture du sol du Canada 2005 (CCT, 2008)

Projection: UTM 20 (NAD 1983)

Figure 14. Map of coniferous habitats in BCR 7 NL.

There are 14 priority bird species found in coniferous habitats within BCR 7 NL (Table 5); all are landbirds and 4 are species at risk. More than half of the priority bird species are specifically found in spruce/lichen coniferous forests (Table 5). Other priority species are found in open, mature, scrub or spruce-fir forests. Ten of these priority bird species were associated exclusively with one of these sub-habitats, while the remaining species use a combination of sub-habitats (Table 5).

The only high magnitude threat to priority species identified in coniferous habitats in BCR 7 NL was a lack of knowledge of priority bird species' distribution, abundance and trends (12.1 Information lacking). The only medium-ranked threat was related to habitat degradation or mortality due to increased frequency and severity of storms (11.4 Storms & flooding; Fig. 15). A low-ranked threat that was frequently identified was habitat loss or degradation from forest harvesting, clear-cutting and fragmentation leading to the loss of forest age structure, breeding habitats and important habitat features such as cone-producing trees (5.3 Logging & wood harvesting; Fig. 15). While there is no large-scale commercial forestry industry in Labrador, there are still areas of productive forests and related ongoing forestry activities that have impacts on priority bird species such as the threats mentioned above.

Recommended conservation objectives and actions for threats ranked "medium" or higher are not presented in this section, as they relate to climate change and research/monitoring needs, which are instead presented in the Widespread Issues section of this document. According to methods outlined in Kennedy et al. (2012), conservation actions recommended for low-ranked threats to priority bird species in coniferous habitats are not presented in this document but are available in the national database.

Table 4. Relative magnitude of identified threats to priority species within BCR 7 NL and MBU 10 NL by threat category and broad habitat class.

Overall ranks were generated through a roll-up procedure described in Kennedy et al. 2012. L represents low magnitude threats; M = medium; H = high; VH = very high. Blank cells indicate that no priority species had threats identified in the threat category/habitat combination.

	BCR 7 NL										MBU 10 NL		
Threat Category	**Habitat Class**										**Habitat Class**		
	Coniferous	Lichens/mosses	Shrub/early successional	Herbaceous	Urban	Wetlands	Inland waterbodies	Coastal (above high tide)	Riparian	**Overall**	Marine waters	Coastal (intertidal)	**Overall**
Overall	**M**	**M**	**H**	**L**	**L**	**H**	**M**	**H**	**M**		**H**	**H**	
1. Residential & commercial development	L				L	L	L	L		**L**		L	**L**
2. Agriculture & aquaculture	L					L				**L**	L	L	**L**
3. Energy production & mining			L					L	L	**L**			
4. Transportation & service corridors	L	L	L		L	L	L	L	L	**L**			
5. Biological resource use	L	L	L		L	L	L	L	L	**L**	H	M	**M**
6. Human intrusions & disturbance	L		L	L		L	L	L		**L**	L	M	**L**
7. Natural system modifications	L		L			L	L	L	L	**L**		L	**L**
8. Invasive & other problematic species & genes	L		L	L	L	L	L	L	L	**L**	L	H	**M**
9. Pollution	L		L	L	L	L	L	M	L	**L**	VH	M	**H**
11. Climate change & severe weather	M	M	H		M	H	M	H		**H**	M	H	**M**
12. Other direct threats	H	H	H	L		VH	M	H	H	**H**	H	H	**H**

Table 5. Priority species in BCR 7 NL that use coniferous habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
American Three-toed Woodpecker	Mature	mature, wet, disturbed (e.g., burns, windthrow, disease, flood), abundant insects (snags and dying trees), open forests in winter	Maintain current					Y		
Black-backed Woodpecker	mature	mature, wet, disturbed (e.g., burns, windthrow, disease, flood), abundant insects (snags and dying trees)	Maintain current			Y		Y		
Boreal Chickadee	spruce-fir	young and mature stands, soft heartwoods	Maintain current			Y				
Common Nighthawk	spruce/lichen forest	spruce/lichen forests, riparian, outstanding tall trees, burns, clear-cuts	Assess/Maintain	Y		Y				
Gray Jay	spruce/lichen forest	spruce, edges, roads and other openings	Maintain current			Y				
Gray-cheeked Thrush	mature; scrub forest	mature, thick understory	Assess/Maintain	Y						
Merlin	spruce/lichen forest	semi-open or fragmented, edges	Maintain current					Y		
Northern Hawk Owl	open; scrub forest; spruce/lichen forest	taiga/tundra transition, closed coniferous forests bordering wetlands or other open areas (e.g., burns, clear-cuts, windthrow), burnt or rotted-out cavities, hollow snags	Maintain current					Y		
Northern Shrike	spruce/lichen forest	open forests, openings, clearing and edges, taiga/tundra transition, outstanding trees or perches	Maintain current			Y		Y		
Olive-sided Flycatcher	scrub forest; spruce/lichen forest	black spruce, openings and edges of wetlands, early successional (e.g., clear-cuts, burns), riparian, snags and tall perches, high	Assess/Maintain	Y	Y					

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Appendix 2.

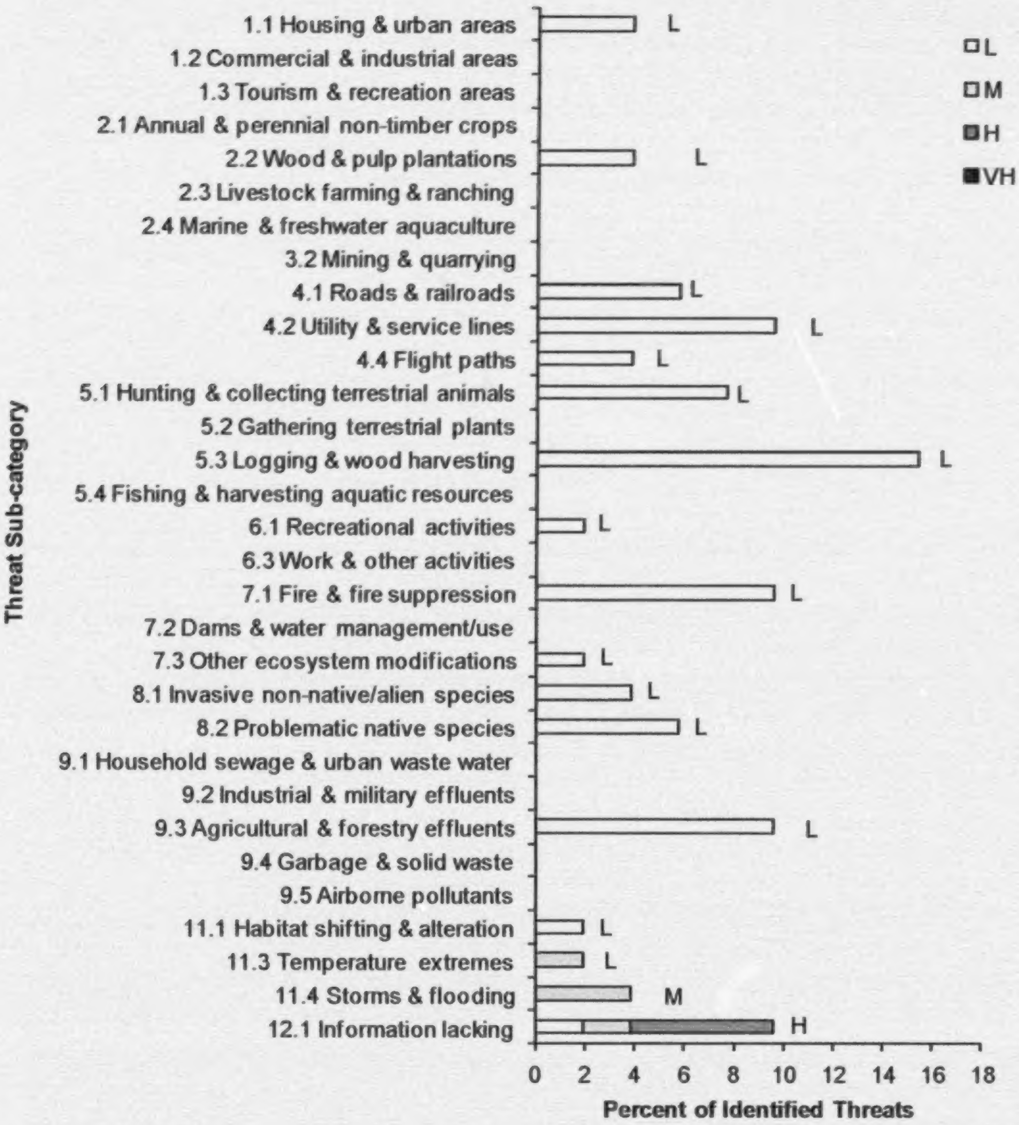


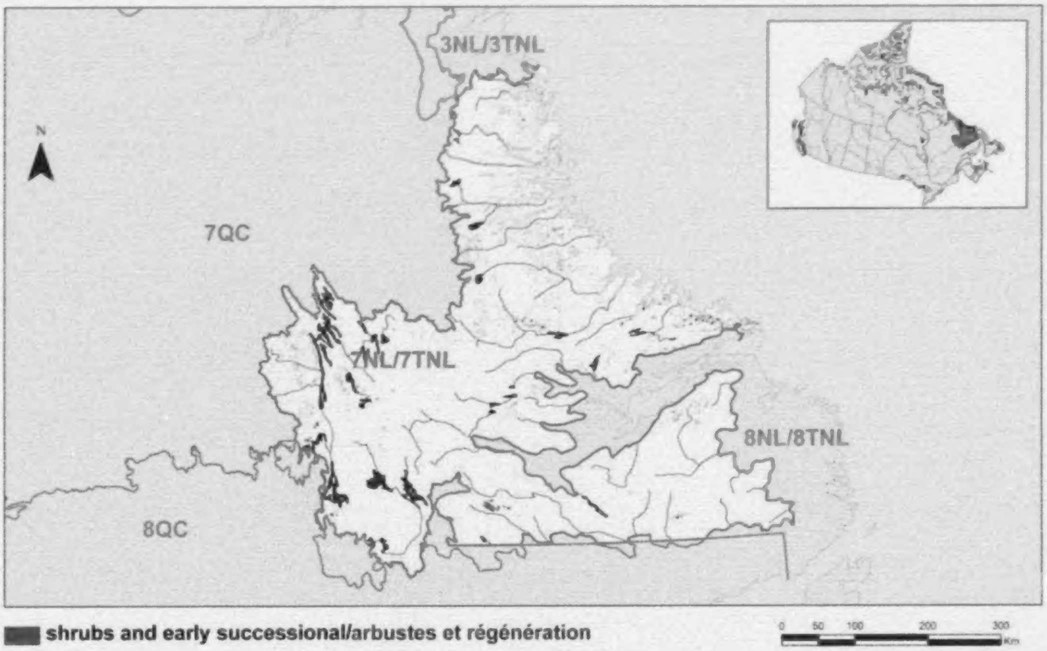
Figure 15. Percent of identified threats to priority species in coniferous habitats for each threat sub-category in BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in coniferous habitats (for example, if 100 threats were identified in total for all priority species in coniferous habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in coniferous habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Shrub/Early Successional

In BCR 7 NL, shrub/early successional habitats are characterized by dry ridges, rocky areas, grassy hummocks and peat bogs (Fig. 16). Vegetation in these areas includes shrubs such as immature balsam fir and black spruce along with varying amounts of white spruce (*Picea glauca)*, larch (*Larix laricina*), sedges, graminoids and berry-bearing plants such as blueberry (*Vaccinium angustifolium*) and raspberry (*Rubus spp.*), as well as Labrador tea (*Rhododendron groenlandicum*), sweetgale (*Myrica gale*), mountain alder (*Alnus crispa*) and rhodora (*Rhododendron canadense*; NL Department of Natural Resources 2012c).



▆ shrubs and early successional/arbustes et régénération

Sources: Land Cover Map of Canada 2005 (CCRS, 2008)
Couverture du sol du Canada 2005 (CCT, 2008)

Projection: UTM 20 (NAD 1983)

Figure 16. Map of shrub and early successional habitats in BCR 7 NL.

There are 12 priority bird species found in shrub/early successional habitats within BCR 7 NL (Table 6): 8 landbirds, 3 shorebirds and 1 waterfowl species. Of these, the Peregrine Falcon (*anatum/tundrius*) and Short-eared Owl are species at risk. Priority species are associated exclusively with the barrens (9 species), high shrubs (1 species), low shrub tundra (1 species) or non-specific tundra (1 species) sub-habitats (Table 6).

High-ranked threats identified in shrub/early successional habitats in BCR 7 NL include a lack of understanding of priority bird species' distribution, abundance and trends (12.1 Information lacking). Others include habitat degradation from changes in habitat structure (e.g., drying, thawing of tundra), shifts in species' ranges, and altered timing of seasonal cues (e.g., migration) and food webs (e.g., prey distribution, abundance, species) due to climate change

(11.1 Habitat shifting & alteration; Fig. 17). Other frequently identified low-ranked threats to priority species include mortality from collisions with tall structures or transmission and utility lines (4.2 Utility & service lines), and mortality from legal hunting, falconry or Aboriginal harvest of eggs and nestlings (5.1 Hunting & collecting of terrestrial animals; Fig. 17).

Recommended conservation objectives and actions for threats ranked “medium” or higher are not presented in this section, as they relate to climate change and research/monitoring needs, which are instead presented in the Widespread Issues section of this document. According to methods outlined in Kennedy et al. (2012), conservation actions recommended for low-ranked threats to priority bird species in shrub/early successional habitats are not presented in this document but are available in the national database.

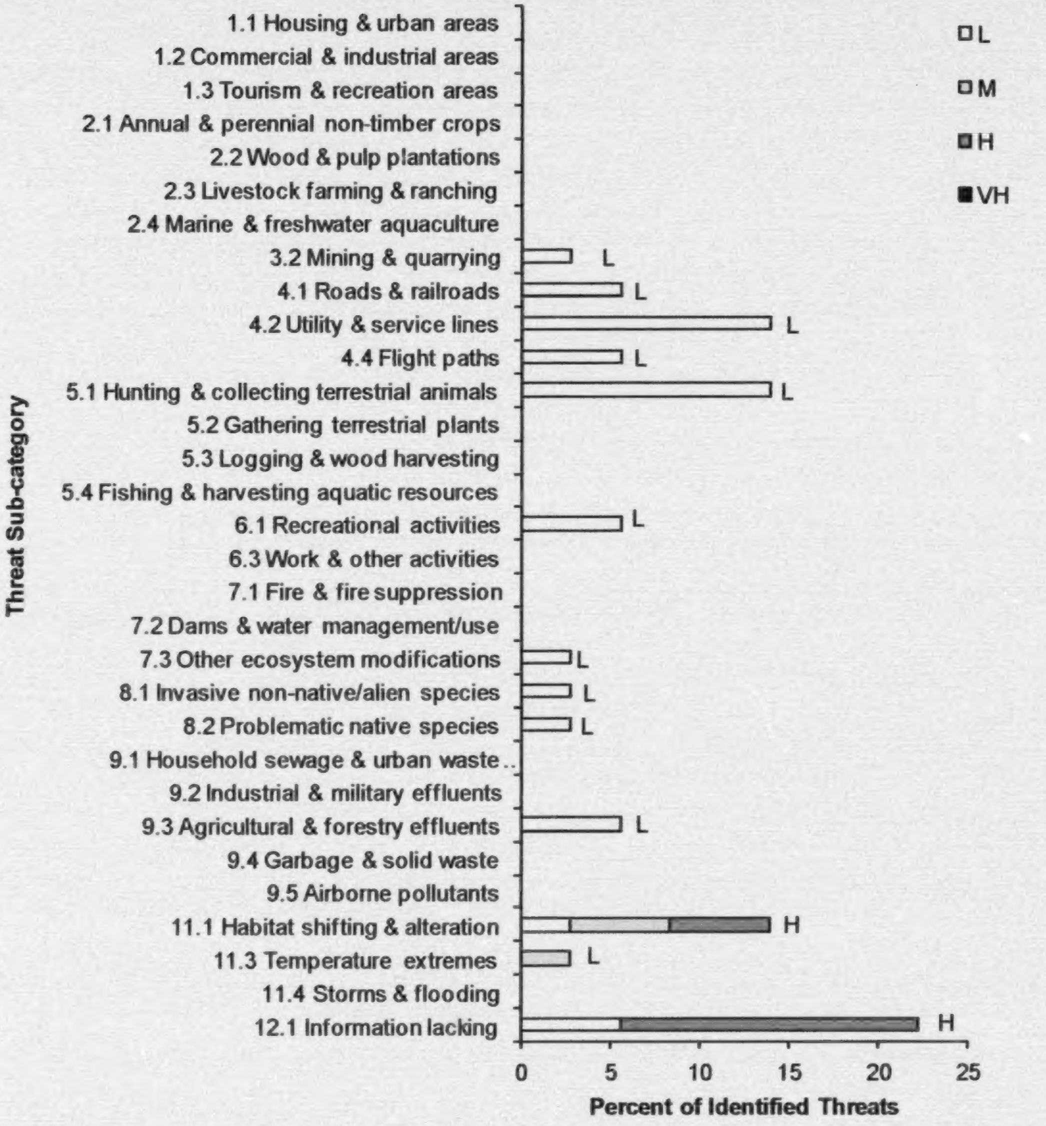


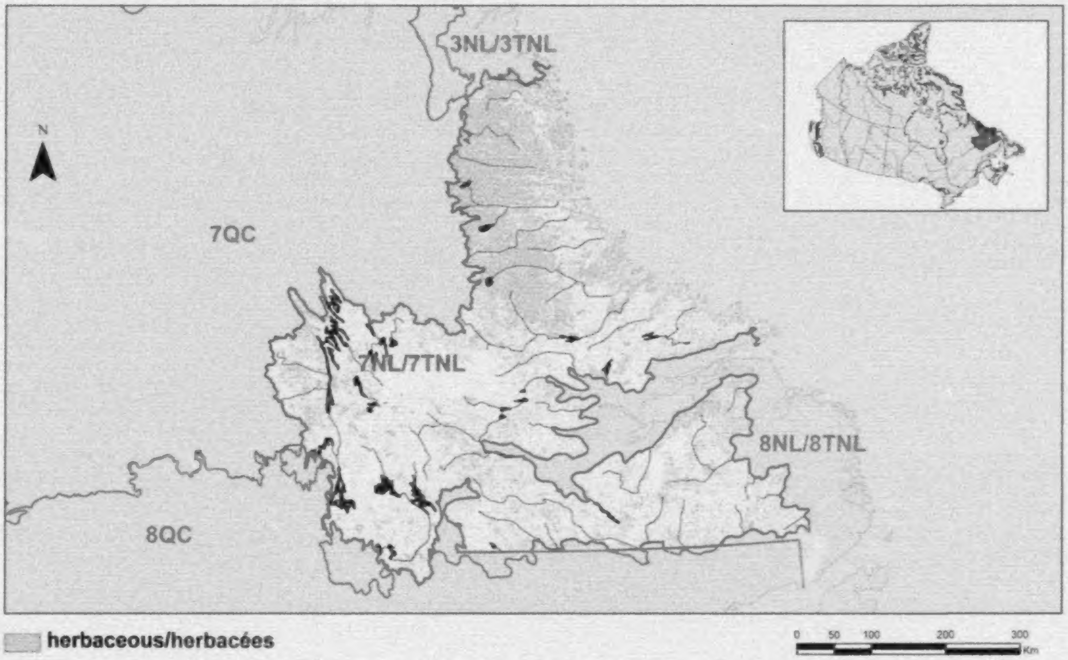
Figure 17. Percent of identified threats to priority bird species in shrub/early successional habitats for each threat sub-category in BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in the shrub/early successional habitats (for example, if 100 threats were identified in total for all priority bird species in shrub/early successional habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in shrub/early successional habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended action.

Herbaceous

In BCR 7 NL, herbaceous habitats include grassy freshwater islands and are natural assemblages of forbs and graminoids that are often associated with "open" areas (Fig. 18).



Sources: Land Cover Map of Canada 2005 (CCRS, 2008)
Couverture du sol du Canada 2005 (CCT, 2008)

Projection: UTM 20 (NAD 1983)

Figure 18. Map of herbaceous habitats in BCR 7 NL.

There are two priority bird species found in herbaceous habitats within BCR 7 NL (Table 7): one landbird that is a species at risk (Short-eared Owl) and one waterbird (Common Tern). The Short-eared Owl is found in natural herbaceous sub-habitats while the Common Tern is associated with islands (Table 7).

All threats identified in herbaceous habitats in BCR 7 NL were ranked "low" overall (Fig. 19). The most frequently identified threat was a lack of knowledge about the distribution, abundance and trends of the Short-eared Owl and the Common Tern (12.1 Information lacking; Fig. 19). The other threats were identified only for the Common Tern and were reductions in fecundity due to disturbance from motor boats and activities near breeding colonies (6.1 Recreational activities); mortality from increasing predation rates on breeding islands (8.1 Invasive non-native/alien species); and mortality from ingestion of and entanglement in garbage or solid waste such as plastics (9.4 Garbage & solid waste; Fig. 19). According to the methods outlined in Kennedy et al. (2012), no recommended conservation objectives and actions are presented here, as the magnitude of the threats to priority species in this habitat type are all "low".

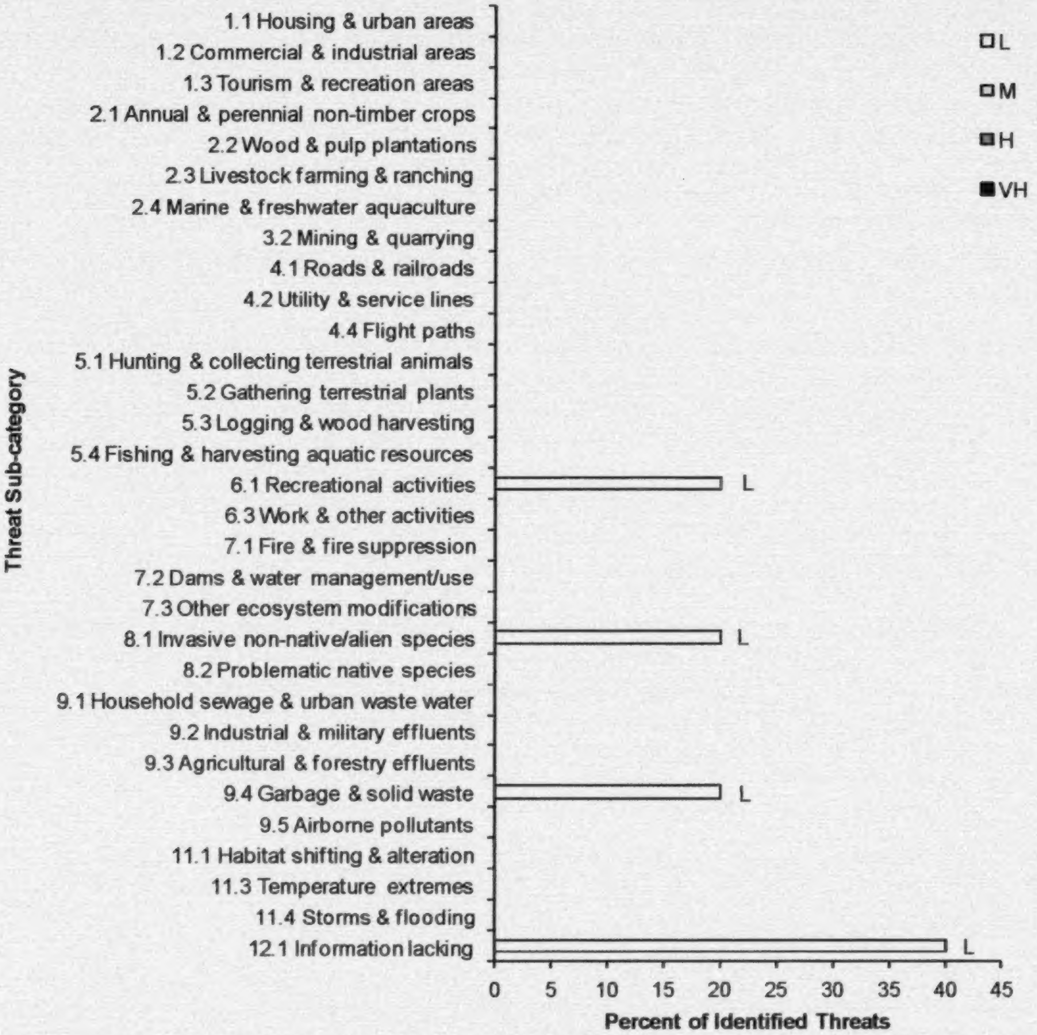


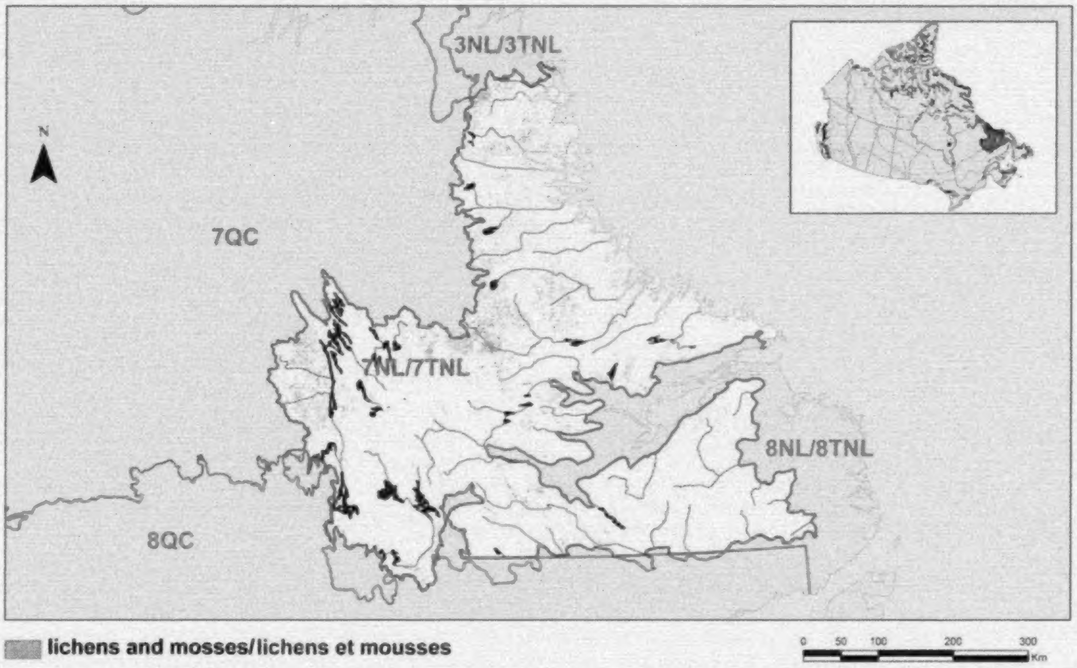
Figure 19. Percent of identified threats to priority bird species in herbaceous habitats for each threat sub-category in BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in herbaceous habitats (for example, if 100 threats were identified in total for all priority bird species in herbaceous habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in herbaceous habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Lichens/Mosses

In BCR 7 NL, lichen/moss habitats are characterized by bare soil, rocky outcrops, standing water and lichens, with limited vegetation such as mosses, sedges and woody shrubs (Fig. 20).



Sources: Land Cover Map of Canada 2005 (CCRS, 2008)
Couverture du sol du Canada 2005 (CCT, 2008)

Projection: UTM 20 (NAD 1983)

Figure 20. Map of lichens and mosses habitats in BCR 7 NL.

There are two priority bird species found in lichen/moss habitats within BCR 7 NL (Table 8): one landbird that is a species at risk (Peregrine Falcon [*anatum/tundrius*]) and one shorebird (Least Sandpiper). These species are associated exclusively with the low tundra sub-habitat (Table 8).

The only high-ranked threat identified in lichen/moss habitats in BCR 7 NL relates to a lack of understanding of the Least Sandpiper's population trends, and a lack of information relating to the impacts of climate change on its habitat (12.1 Information lacking; Fig. 21). There are also high magnitude threats to this species from range shifts, habitat alternations and changes in timing of egg laying due to climate change (11.1 Habitat shifting & alteration; Fig. 21). The only medium-ranked threat was identified for the Peregrine Falcon (*anatum/tundrius*) and related to habitat degradation from changes in food webs (e.g., prey distribution, abundance, species) due to climate change (11.1 Habitat shifting & alteration; Fig. 21).

Recommended conservation objectives and actions for threats ranked "medium" or higher are not presented in this section, as they relate to climate change and research/monitoring needs, which are instead presented in the Widespread Issues section of this document. According to methods outlined in Kennedy et al. (2012), conservation actions recommended for low-ranked threats to priority bird species in lichen/moss habitats are not presented in this document but are available in the national database.

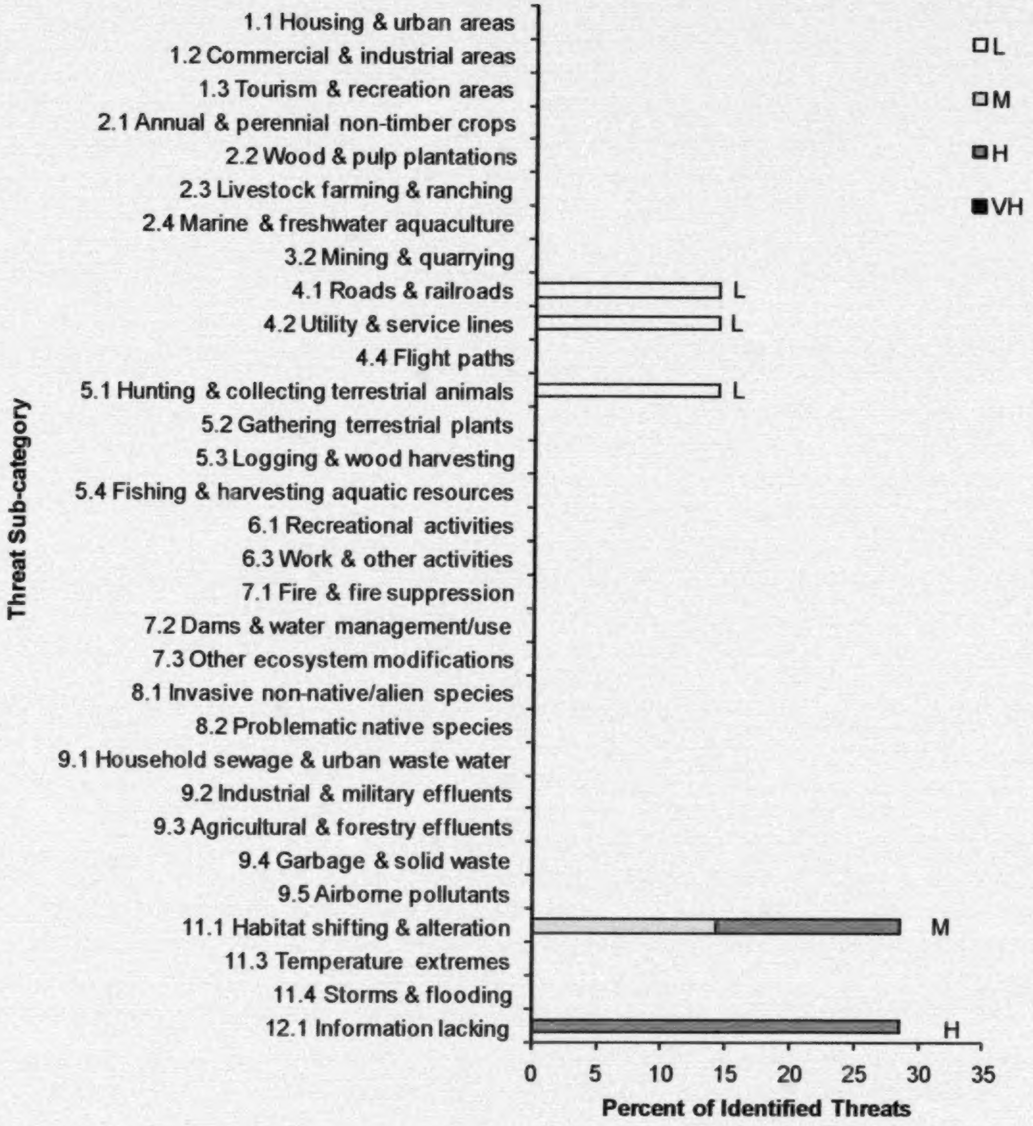


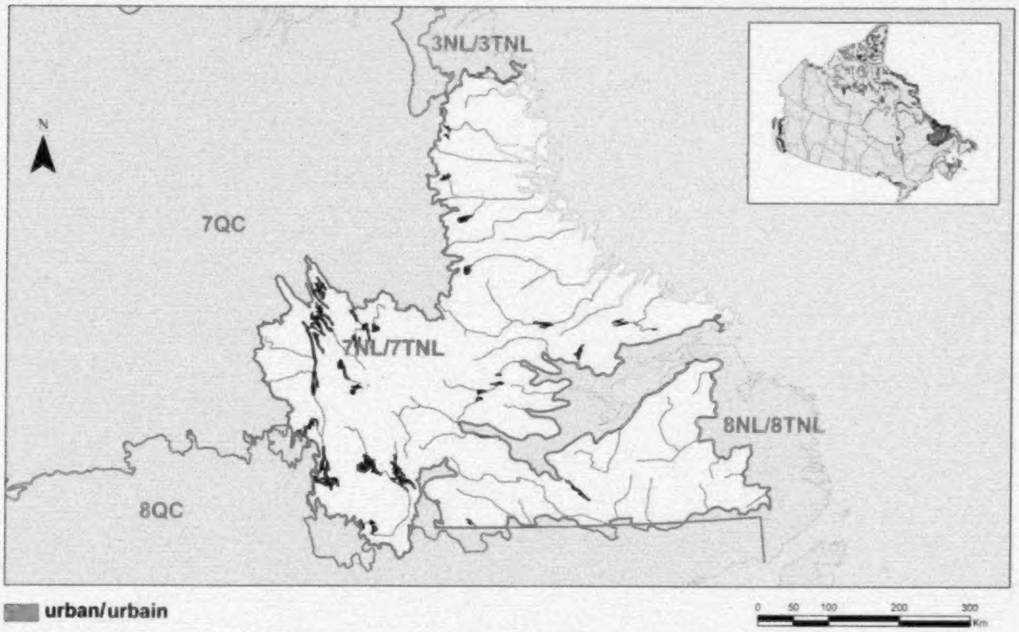
Figure 21. Percent of identified threats to priority bird species in lichens/mosses habitat in each threat sub-category of BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in lichens/mosses habitats (for example, if 100 threats were identified in total for all priority bird species in lichens/mosses habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in lichens/mosses habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Urban

In BCR 7 NL, urban habitats, which include artificial surfaces, are characterized by gravel roads, quarries, buildings, bridges, towers and other artificial structures (Fig. 22).



Sources: Land Cover Map of Canada 2005 (CCRS, 2008), Land Cover circa 2000 (CTI, 2009), Canvec v.9.0 (CTI, 2011)
Couverture du sol du Canada 2005 (CCT, 2008), Couverture du sol circa 2000 (CIT, 2009), Canvec v.9.0 (CIT, 2011)

Projection: UTM 20 (NAD 1983)

Figure 22. Map of urban habitats in BCR 7 NL.

There are two priority bird species found in urban habitats within BCR 7 NL (Table 9); both are landbirds and species at risk. The Peregrine Falcon (*anatum/tundrius*) uses buildings and bridges, while the Common Nighthawk can be found in gravel areas (Table 9).

All threats identified in urban habitats in BCR 7 NL were ranked "low" (Fig. 23). The most frequently identified threats were habitat loss due to the replacement of flat gravel rooftops used by Common Nighthawks with smooth surfaces; mortality of Peregrine Falcons (*anatum/tundrius*) from collisions with buildings (1.1 Housing & urban areas); and mortality of both priority species due to collisions with moving vehicles (4.1 Roads & railroads; Fig. 23).

According to the methods outlined in Kennedy et al. (2012), no recommended conservation objectives and actions are presented here, as the magnitude of the threats to priority species in this habitat type are all "low". However, that information is available upon request from the national database.

Table 5 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
		elevations/montane								
Palm Warbler	open; scrub forest	edges or clumps of trees	Maintain current		Y	Y		Y		
Pine Grosbeak	spruce/lichen forest	cone producing trees, taiga/treeline	Maintain current		Y	Y		Y		
Rough-legged Hawk	spruce/lichen forest	taiga/tundra transition, open	Maintain current			Y		Y		
Rusty Blackbird	spruce/lichen forest	edges, wet, disturbed (e.g., burns, windthrow, beaver-modified wetlands)	Maintain current	Y	Y			Y		

Table 6. Priority species in BCR 7 NL that use shrub/early successional habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
American Golden-Plover	Barrens	low vegetation on dry rocky slopes, snow free	Assess/Maintain		Y			Y		
Canada Goose (North Atlantic)	barrens	dwarf willow, barrens	Increase 50%		Y				Y	
Gyrfalcon	barrens	steep cliffs along marine coasts	Maintain current			Y		Y		
Merlin	barrens	open areas, sparse trees	Maintain current					Y		
Northern Shrike	high shrubs	open forests, openings, clearings and edges, taiga/tundra transition, outstanding trees or perches	Maintain current			Y		Y		
Palm Warbler	barrens	barrens, frequent clumps of dwarf trees	Maintain current		Y	Y		Y		
Peregrine Falcon (*anatum/tundrius*)	barrens	steep cliffs, crevices	Assess/Maintain	Y		Y				
Rough-legged Hawk	non-specific tundra	open tundra for foraging	Maintain current			Y		Y		
Semipalmated Sandpiper	barrens	dry ridges, shrubs, sedges, graminoids, rocky areas, grassy hummocks, peat bogs, berry bearing plants	Assess/Maintain		Y			Y		
Short-eared Owl	low shrub tundra	small willows, open, small mammal abundance	Assess/Maintain	Y	Y			Y		
Swamp Sparrow	barrens		Maintain current		Y	Y		Y		
Whimbrel	barrens	upland heaths, flooded fields	Assess/Maintain		Y			Y		

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Appendix 2.

Table 7. Priority species in BCR 7 NL that use herbaceous habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
Common Tern	islands	grassy islands near coastline or in marine waters	Assess/Maintain		Y					
Short-eared Owl	natural herbaceous	well-drained, dense, near wetlands, coastal, open, small mammal abundance	Assess/Maintain	Y	Y			Y		

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and in Appendix 2.

Table 8. Priority species in BCR 7 NL that use lichens/mosses habitat, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
Least Sandpiper	low tundra	moist sedge meadows and tundra	Assess/Maintain		Y					
Peregrine Falcon (*anatum/tundrius*)	low tundra	open	Assess/Maintain	Y		Y				

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Appendix 2.

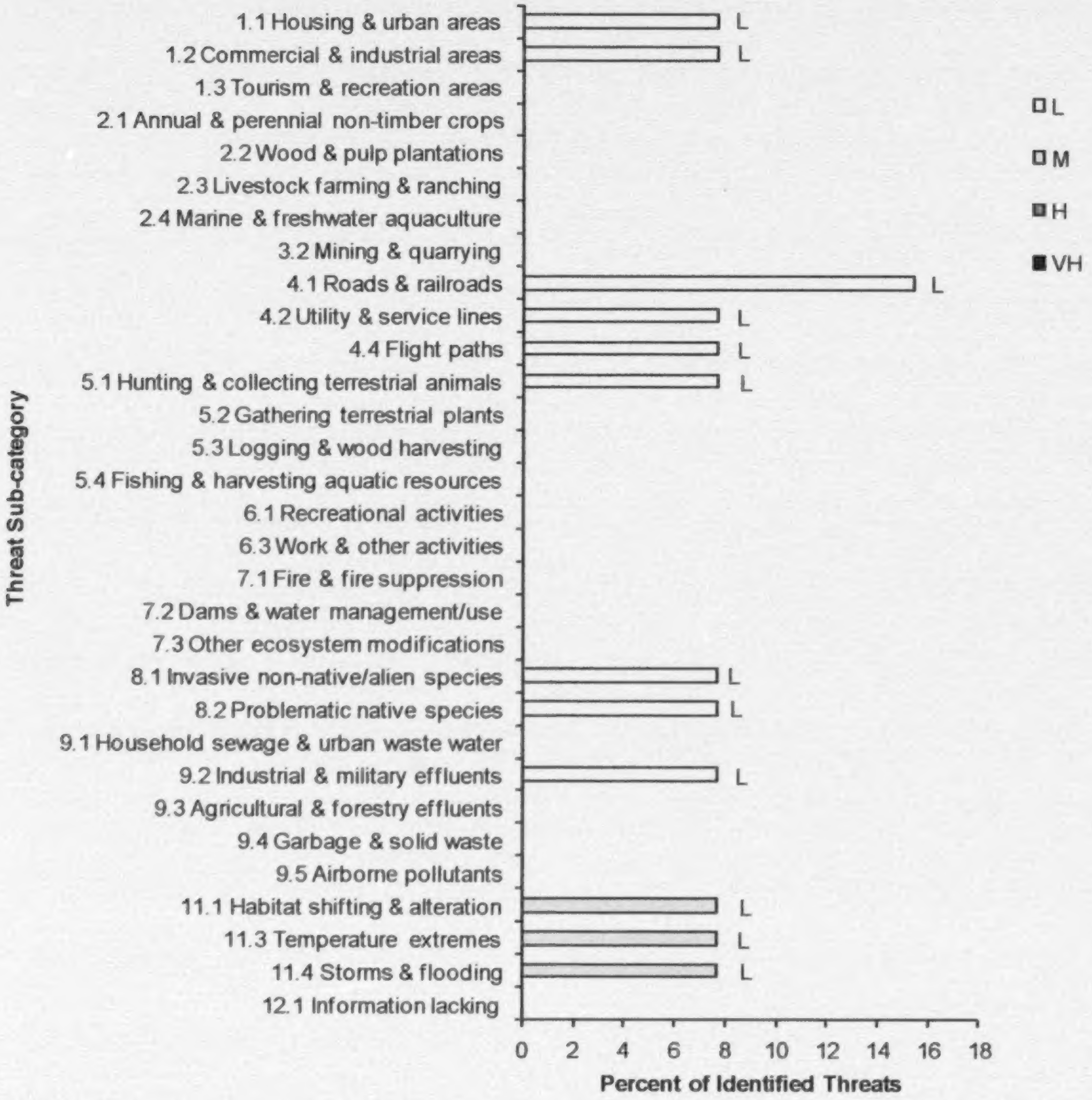


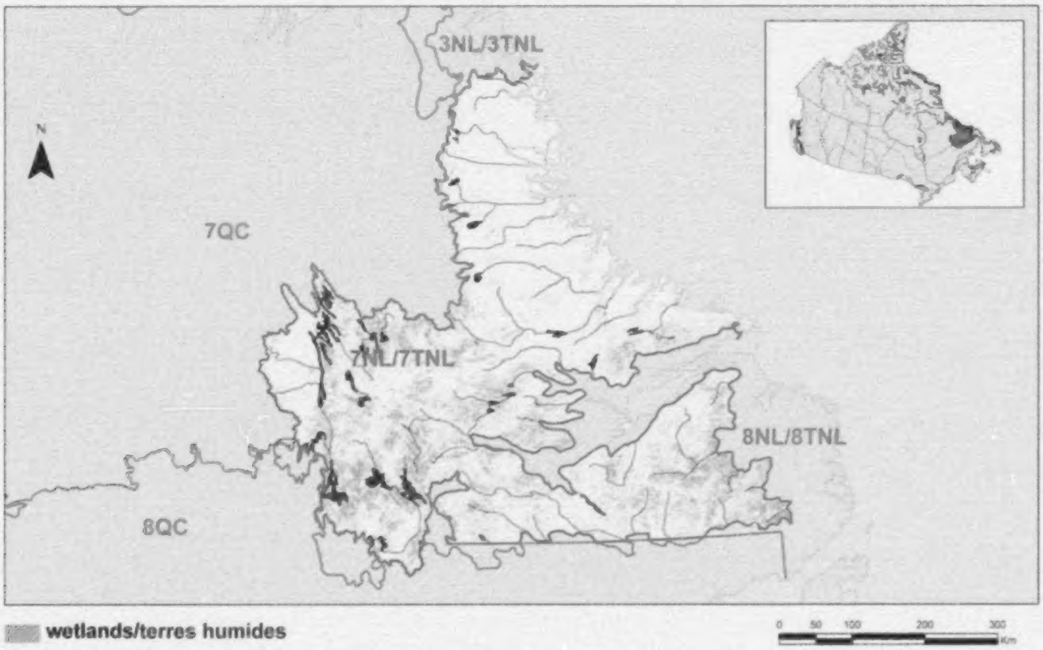
Figure 23. Percent of identified threats to priority bird species in urban habitats for each threat sub-category in BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in urban habitats (for example, if 100 threats were identified in total for all priority bird species in urban habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in urban habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Wetlands

In BCR 7 NL, wetland habitats are found at both low and high elevations and are characterized by emergent vegetation and standing water (Fig. 24). This habitat class is represented by plant species tolerant of saturated soils and includes both bogs and fens.



Sources: Land Cover circa 2000 (CTI, 2009), Canvec v.9.0 (CTI, 2011)
Couverture du sol circa 2000 (CIT, 2009), Canvec v.9.0 (CIT, 2011)

Projection: UTM 20 (NAD 1983)

Figure 24. Map of wetland habitats in BCR 7 NL.

There are 19 priority bird species found in wetland habitats within BCR 7 NL (Table 10): 6 waterfowl, 1 waterbird, 4 shorebirds and 8 landbirds. Of these, 4 are species at risk. Nearly all of the priority bird species are found in either fens or bogs (Table 10). Priority species are also found in non-specific freshwater wetlands (5 species; Table 10). Eleven of these priority bird species are associated exclusively with one of these sub-habitats, while the remaining can be found in both bogs and fens (Tables 10).

The lack of understanding of priority bird species' distribution, abundance and trends (12.1 Information lacking; Fig. 25) was identified as a very high magnitude threat to priority bird species in wetland habitats in BCR 7 NL. Another high magnitude threat to priority species in wetlands was attributed to threat sub-category 11.1 Habitat shifting & alteration and includes climate change–driven habitat loss or degradation (e.g., drying, thawing of tundra), shifts in species' ranges, altered timing of seasonal cues (e.g., egg laying), and changes to food webs (e.g., prey distribution, abundance, species). A medium-ranked threat, also relating to climate change, stems from habitat degradation or mortality due to severe weather and increased frequency of storms (11.4 Storms & flooding; Fig. 25). Other low magnitude threats to priority species that were frequently identified were hunting, poaching and incidental take (5.1 Hunting & collecting terrestrial animals), and habitat degradation or lethal/sublethal effects due to pesticide contamination, either by direct exposure or consumption of contaminated prey such as spruce budworm (9.3 Industrial & military effluents; Fig. 25).

Recommended conservation objectives and actions for threats ranked "medium" or higher are not presented in this section, as they relate to climate change and research/monitoring needs, which are instead presented in the Widespread Issues section of this document. According to methods outlined in Kennedy et al. (2012), conservation actions recommended for low-ranked threats to priority bird species in wetland habitats are not presented in this document but are available in the national database.

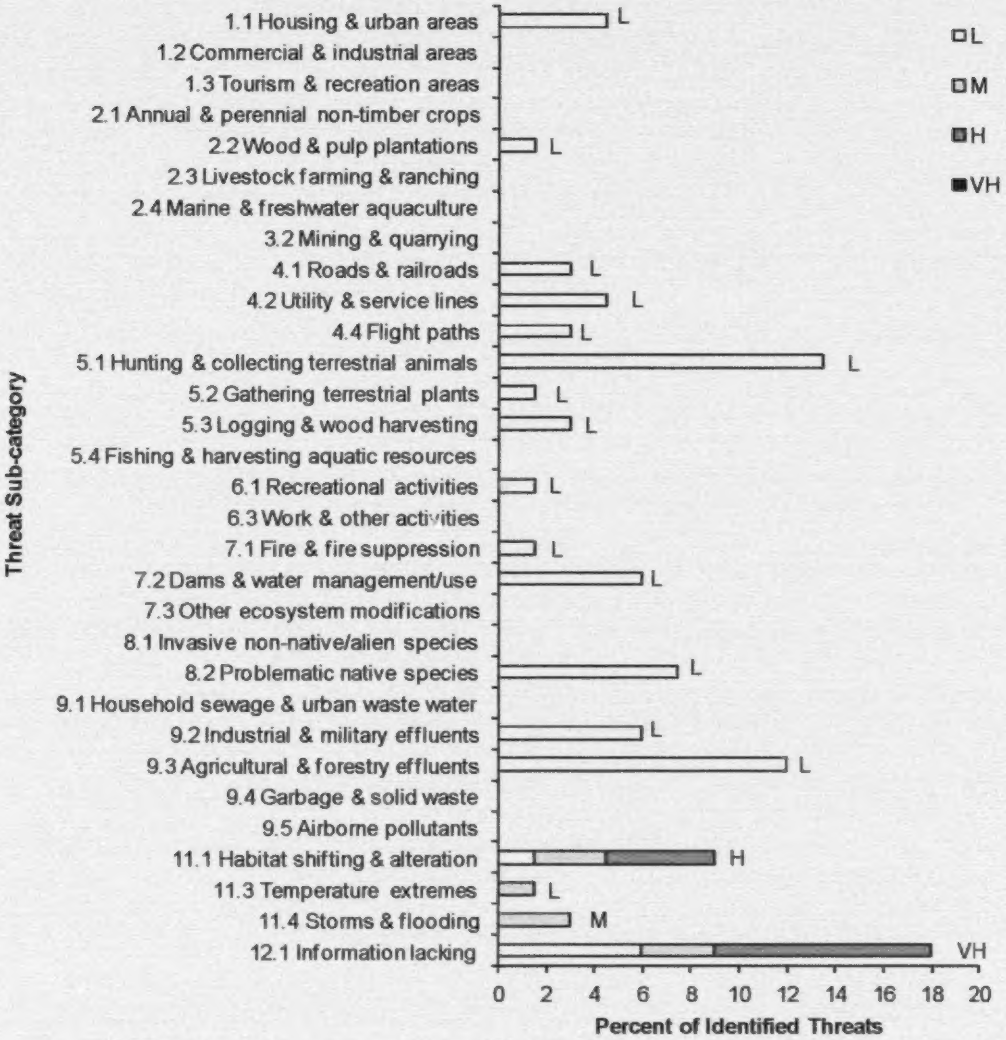


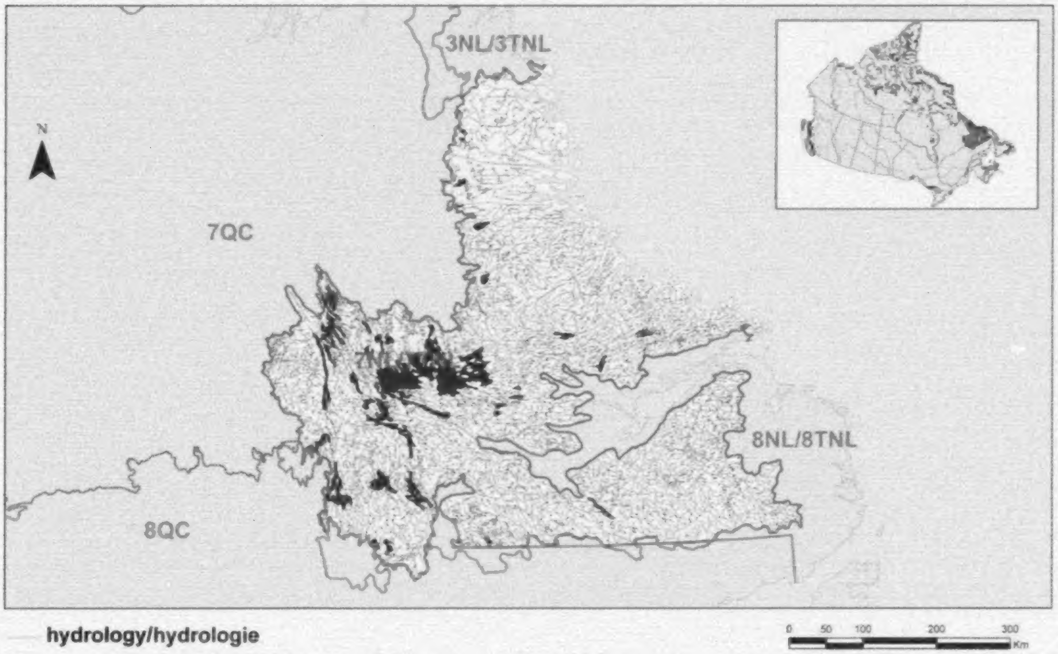
Figure 25. Percent of identified threats to priority bird species in wetland habitats for each threat sub-category in BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in wetland habitats (for example, if 100 threats were identified in total for all priority bird species in wetland habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in wetland habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Riparian

Riparian areas are the transition zone where land meets water along rivers, streams, lakes, ponds and estuaries, and they may be treed, shrubby or herbaceous, depending on site conditions (Fig. 26). In BCR 7 NL, riparian habitats are characterized by forested river valleys, sandy margins of lakes and ponds, upland tundra areas that drain into standing water, and other areas close to bodies of water.



Sources: Atlas of Canada 1,000,000 National Framework Data - Hydrology (CCRS, 2008)
Données-cadre nationales de l'Atlas du Canada à l'échelle du 1/1 000 000 - Hydrologie (CCT, 2008)

Projection: UTM 20 (NAD 1983)

Figure 26. Map of riparian habitats in BCR 7 NL.

There are 13 priority bird species found in riparian habitats within BCR 7 NL (Table 11): 3 waterfowl, 3 shorebirds and 7 landbirds. Of these, 3 are species at risk. Most of the priority bird species are found in bare areas (6 species) while the remaining are associated with coniferous forests (4 species), scrub forests (1 species), low tundra (1 species) and non-specific shrub areas (1 species; Table 11). Eleven of these priority bird species are associated exclusively with one of these sub-habitats, while the Semipalmated Sandpiper uses both bare areas and low tundra sub-habitats (Table 11).

High magnitude threats to priority bird species identified in riparian habitats in BCR 7 NL include a lack of knowledge of priority bird species' distribution, population abundance and trends (12.1 Information lacking); and habitat loss or degradation due to climate change (11.1 Habitat shifting & alteration; Fig. 27). The loss of priority species' habitat can cause shifts in the species' ranges or changes in the structure of habitats. Habitat degradation may be caused by changes in food webs, prey distribution and abundance, or seasonal cues. Mortality due to thermal stress or cold snaps in spring (11.3 Temperature extremes; Fig. 27) was identified as a medium magnitude threat in riparian habitats. Low magnitude threats that were frequently identified include lethal/sublethal effects due to chemical or heavy metal contamination such as mercury, PCB or lead contamination (9.2 Industrial & military effluents); and hunting, poaching of eggs and nestlings, or incidental take (5.1 Hunting & collecting terrestrial animals; Fig. 27).

Recommended conservation objectives and actions for threats ranked "medium" or higher are not presented in this section, as they relate to climate change and research/monitoring needs, which are instead presented in the Widespread Issues section of this document. According to methods outlined in Kennedy et al. (2012), conservation actions recommended for low-ranked threats to priority bird species in riparian habitats are not presented in this document but are available in the national database.

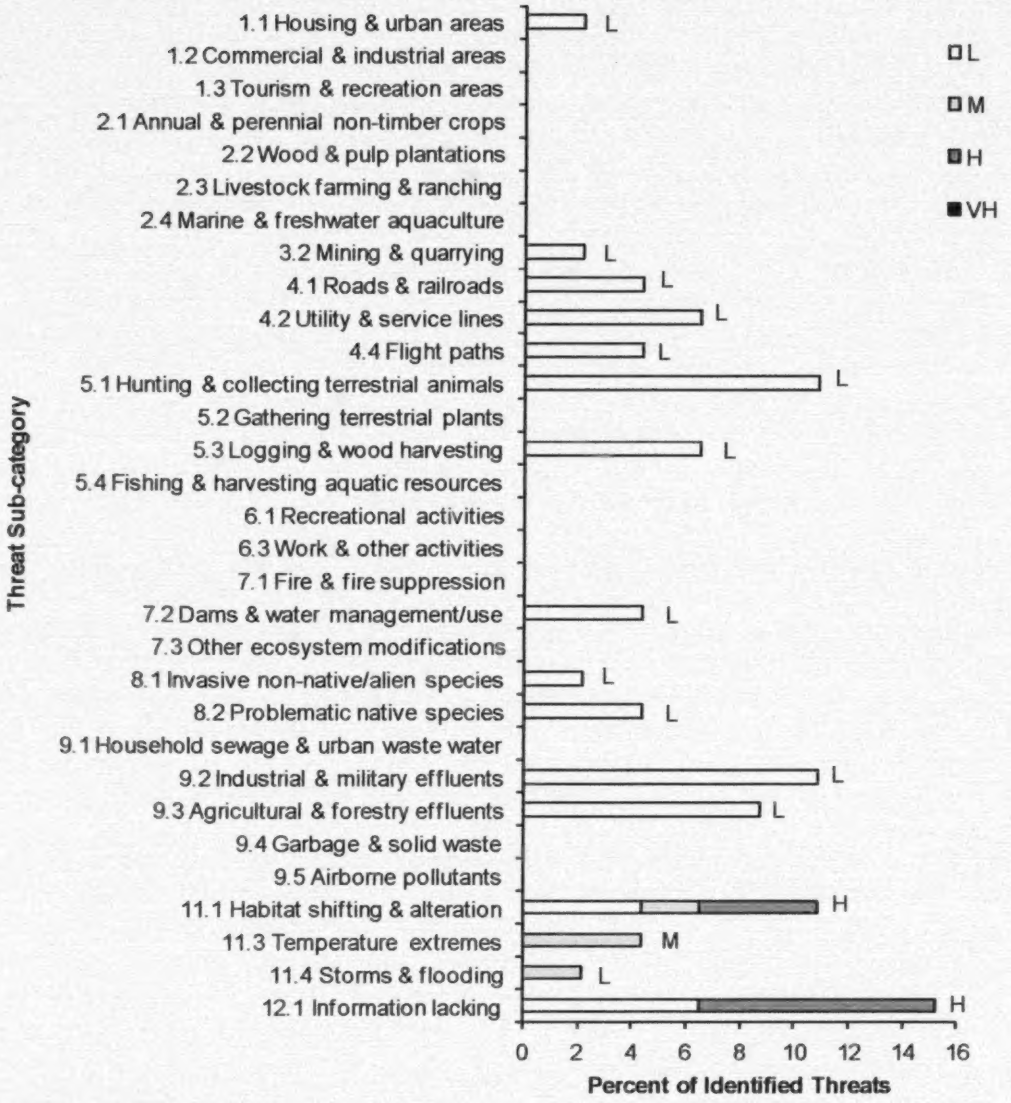


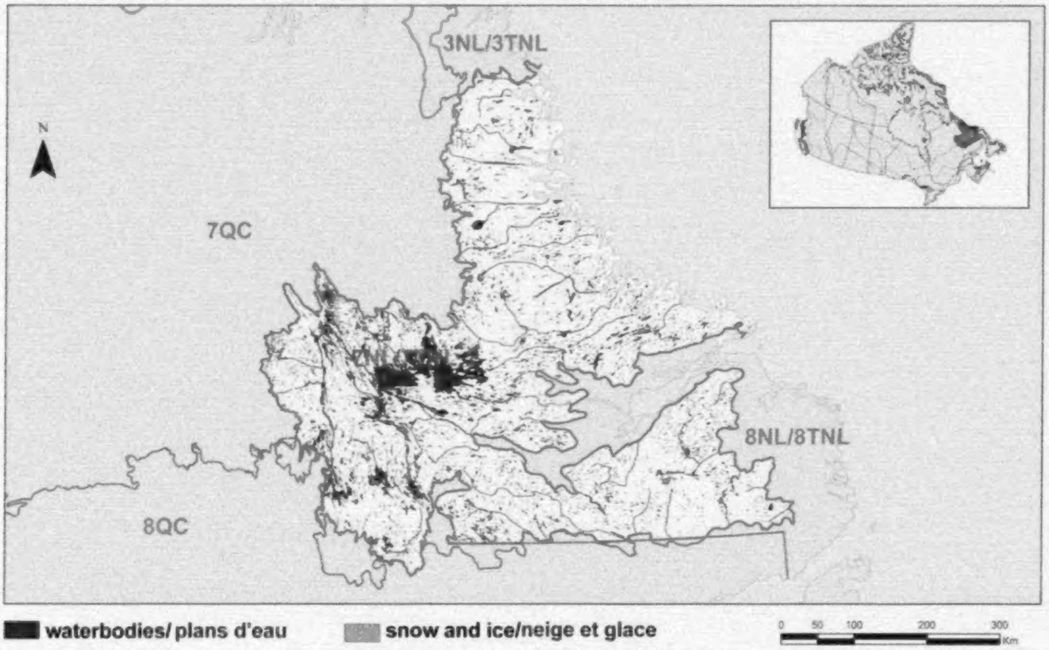
Figure 27. Percent of identified threats to priority bird species in riparian habitats for each threat sub-category in BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in riparian habitats (for example, if 100 threats were identified in total for all priority bird species in riparian habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in riparian habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Inland Waterbodies

In BCR 7 NL, inland waterbodies includes freshwater lakes, ponds, rivers and streams (Fig. 28). Shallow soil and bedrock deeply scored by glaciers are responsible for the numerous lakes, ponds and rivers scattered across Labrador. The area of freshwater in Newfoundland and Labrador is 31 340 km^2, covering approximately 4.1% of the province (Statistics Canada 2005).



Sources: Atlas of Canada 1,000,000 National Framework Data - Hydrology (CCRS, 2008), Land Cover Map of Canada 2005 (CCRS, 2008) Données-cadre nationales de l'Atlas du Canada à l'échelle du 1/1 000 000 - Hydrologie (CCT, 2008), Couverture du sol du Canada 2005 (CCT, 2008)

Projection: UTM 20 (NAD 1983)

Figure 28. Map of inland waterbodies in BCR 7 NL; there is no area covered by snow or ice for the majority of the year, and the boundaries of BCR 7 NL do not extend into marine waters.

There are 12 priority bird species found in inland waterbodies of BCR 7 NL (Table 12): 9 waterfowl and 3 waterbirds. Only the Harlequin Duck (Eastern) is a species at risk. Nine priority bird species are found in lakes or ponds, 4 species in rivers or streams and 1 species in non-specific freshwater (Table 12). Ten of these priority bird species are associated exclusively with one of these sub-habitats, while the Common Goldeneye and Common Loon can be found in both lakes or ponds and rivers or streams (Table 12).

Several medium magnitude threats to priority bird species in inland waterbodies of BCR 7 NL were identified (Fig. 29). Climate change–driven habitat shifting and alteration (threat sub-category 11.1) includes habitat loss or degradation (e.g., drying, thawing of tundra), shifts in species' ranges, altered timing of seasonal cues (e.g., egg laying) and food webs (e.g., prey distribution, abundance, species composition). Another medium magnitude threat is the lack of knowledge about priority bird species' distribution, population abundance and trends (12.1 Information lacking). Other low magnitude threats that were frequently identified are legal hunting, poaching and incidental take (5.1 Hunting & collecting terrestrial animals); habitat degradation or lethal/sublethal effects due to the use of pesticides (9.3 Industrial & military effluents); and habitat degradation due to chemical contamination (e.g., mining effluents, changes to water chemistry) or lethal/sublethal effects from bioaccumulation of contaminated water and sediments or prey (9.2 Industrial & military effluents; Fig. 29).

Recommended conservation objectives and actions for threats ranked "medium" or higher are not presented in this section, as they relate to climate change and research/monitoring needs, which are instead presented in the Widespread Issues section of this document. According to methods outlined in Kennedy et al. (2012), conservation actions recommended for low-ranked threats to priority bird species in inland waterbodies are not presented in this document but are available in the national database.

Table 9. Priority species in BCR 7 NL that use urban habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
Common Nighthawk	gravel	gravel roads, airports, urban parks, quarries, mines	Assess/Maintain	Y	Y					
Peregrine Falcon (*anatum/tundrius*)	buildings and bridges	buildings, bridges, towers	Assess/Maintain	Y		Y				

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and in Appendix 2.

Table 10. Priority species in BCR 7 NL that use wetland habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
American Black Duck	bog; fen	Bogs, fens and estuaries with emergent vegetation, beaver-modified or flooded, salt or freshwater	Maintain current		Y				Y	
Canada Goose (North Atlantic)	bog; fen	muddy bottom, emergent vegetation, lowland sedge/grass meadows, small islands	Increase 50%		Y				Y	
Common Nighthawk	non-specific freshwater wetlands	insect abundance	Assess/Maintain	Y	Y					
Gray Jay	non-specific freshwater wetlands	spruce bog	Maintain current			Y				
Green-winged Teal	bog; fen	muddy bottoms, dense vegetation, shrub-swamps	Increase 50%						Y	
Least Sandpiper	bog; fen	marine and freshwater, flooded grassy fields; bogs (often along treeline)	Assess/Maintain		Y					
Long-tailed Duck	bog; fen	arctic and sub-arctic, open water, emergent vegetation, low elevation, shallow, islands in freshwater ponds, tundra	Assess/Maintain		Y			Y	Y	
Northern Hawk Owl	bog	tamarack bog, muskeg, near forest edges	Maintain current					Y		
Olive-sided	bog	muskeg bogs and swamps, spruce,	Assess/Maintain	Y	Y					

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and in Appendix 2.

Table 10 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
Flycatcher		tamarack, snags and tall perches								
Palm Warbler	bog		Maintain current		Y	Y		Y		
Red-throated Loon	non-specific freshwater wetlands	low elevation wetlands (bog, fen, low lying shores of marsh), string bog	Assess/Maintain		Y					
Ring-necked Duck	bog; fen	beaver-modified, dense emergent sedges and floating vegetation, shallow, stable water level	Increase 100%						Y	
Rusty Blackbird	bog	peat bogs with coniferous trees, associated with recent burns or beaver-created wetlands	Maintain current	Y	Y			Y		
Semipalmated Sandpiper	bog	sedge-grass or heath, rocky areas, grassy hummocks, peat bogs, berry bearing plants	Assess/Maintain		Y			Y		
Short-eared Owl	bog	near open forest, small mammal abundance	Assess/Maintain	Y	Y			Y		
Solitary Sandpiper	bog; fen	edge of coniferous forests	Assess/Maintain		Y					
Surf Scoter	non-specific freshwater wetlands		Assess/Maintain		Y			Y	Y	
Swamp Sparrow	non-specific freshwater wetlands	open water, dense low vegetation (grasses and shrubs), available perches for singing	Maintain current		Y	Y		Y		
Wilson's Snipe	bog; fen	treeless, including riparian areas, flooded grassy fields, short grasses, sedge, and nutrient-rich depressions	Assess/Maintain					Y		

Table 11. Priority species in BCR 7 NL that use riparian habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
Common Goldeneye	coniferous forests	tree cavities, rock cavities	Maintain current		Y				Y	
Common Nighthawk	bare areas	beaches, sand dunes, lakeshores, river banks, riparian, clear-cuts	Assess/Maintain	Y	Y					
Green-winged Teal	coniferous forests		Increase 50%						Y	
Gyrfalcon	bare areas	steep cliffs with overhang	Maintain current			Y		Y		
Least Sandpiper	bare areas	margins of lakes, ponds and rivers	Assess/Maintain		Y					
Merlin	forests		Maintain current					Y		
Peregrine Falcon (*anatum/tundrius*)	bare areas	steep cliffs, crevices, river valleys	Assess/Maintain	Y		Y				
Rough-legged Hawk	bare areas	cliffs, elevated rocky outcrops, coastal and riverine, forested river valleys	Maintain current			Y		Y		
Rusty Blackbird	scrub forest	wet, edges, disturbed (e.g., burns, windthrow, beaver-modified wetlands)	Maintain current	Y	Y			Y		
Semipalmated Sandpiper	bare areas; low tundra	upland tundra with low vegetation and varying drainage, close to lakes, ponds and streams, coastal; sandy areas along rivers	Assess/Maintain		Y			Y		
Solitary Sandpiper	coniferous forests	near remote ponds, lakes and rivers	Assess/Maintain		Y					
Surf Scoter	coniferous forests	small lakes/ponds	Assess/Maintain		Y			Y	Y	
Swamp Sparrow	non-specific shrub	bushy growth, hedgerows, thickets, dense	Maintain current		Y	Y		Y		

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and in Appendix 2.

Table 12. Priority species in BCR 7 NL that use inland waterbodies, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
American Black Duck	non-specific freshwater	lakes and ponds, rivers and impoundments	Maintain current		Y				Y	
Black Scoter	lakes/ponds	shallow, rocky shorelines	Assess/Maintain		Y			Y	Y	
Canada Goose (North Atlantic)	lakes/ponds	moss covered islets within lake for nesting, string bogs	Increase 50%		Y				Y	
Common Goldeneye	lakes/ponds; rivers/streams	wide, deep and slow flowing, fishless	Maintain current		Y				Y	
Common Loon	lakes/ponds; rivers/streams	large lakes with rocky and convoluted shorelines, oligotrophic, tundra lakes, floating bogs	Assess/Maintain		Y					
Common Tern	lakes/ponds	shallow areas, clear water for foraging, rocky islands	Assess/Maintain		Y					
Green-winged Teal	rivers/streams	rivers, oxbows off meandering rivers	Increase 50%						Y	
Harlequin Duck (Eastern)	rivers/streams	fast flowing, abundant invertebrates, narrow, large substrates, steep banks	Assess/Maintain	Y	Y				Y	
Long-tailed Duck	lakes/ponds	deep	Assess/Maintain		Y			Y	Y	
Red-throated Loon	lakes/ponds	shallow, organic bottoms, often high elevation	Assess/Maintain		Y					
Ring-necked Duck	lakes/ponds	margins of shallow ponds and small lakes	Increase 100%					Y	Y	
Surf Scoter	lakes/ponds	shallow, free of vegetation, rocky shores	Assess/Maintain		Y			Y	Y	

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and in Appendix 2.

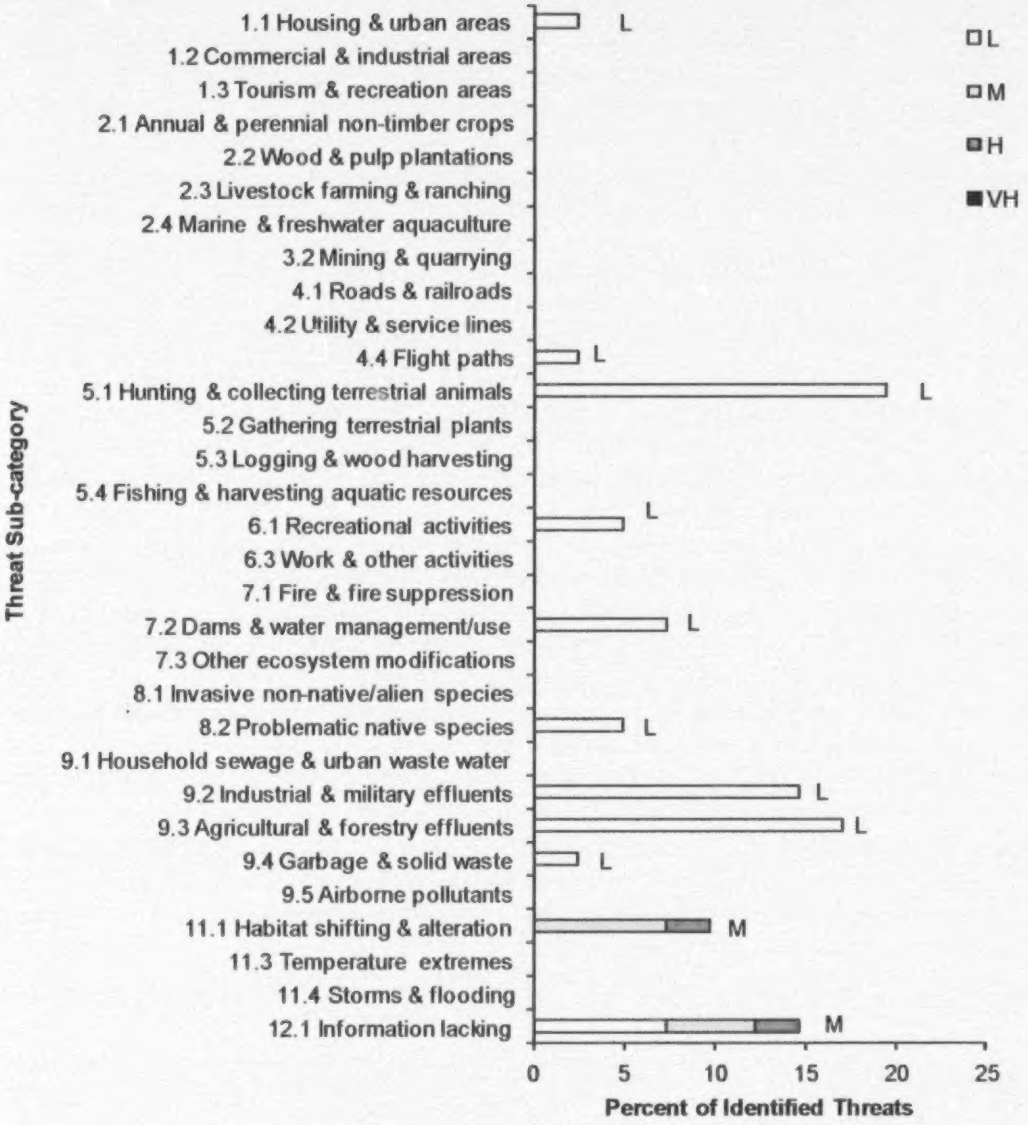


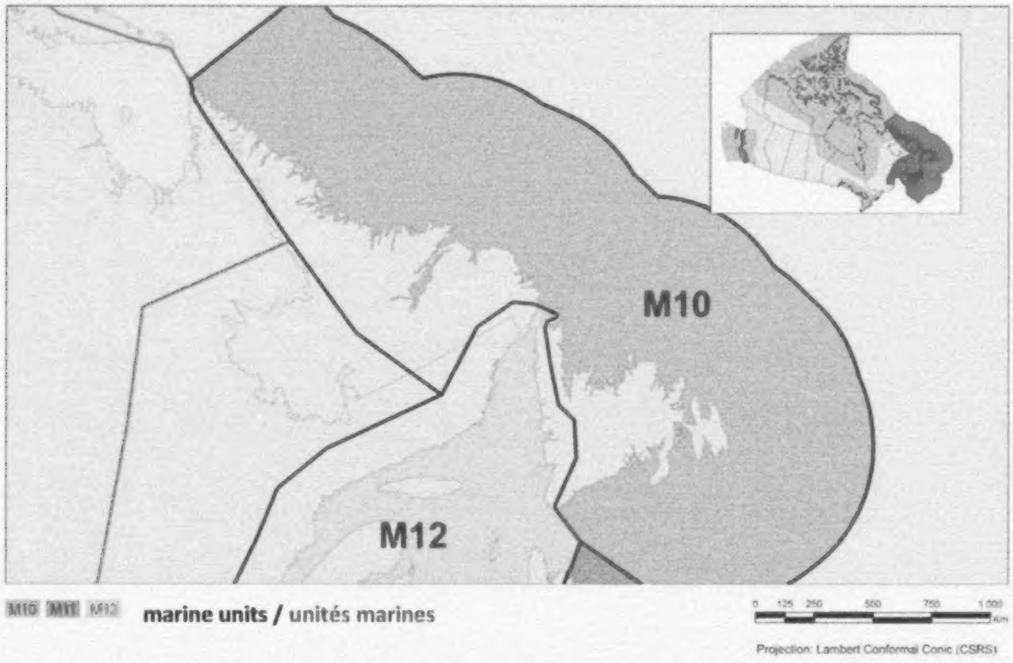
Figure 29. Percent of identified threats to priority bird species in inland waterbodies for each threat sub-category in BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in inland waterbodies (for example, if 100 threats were identified in total for all priority bird species in inland waterbodies, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in inland waterbodies is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Marine Waters – Newfoundland-Labrador Shelves

In MBU 10 NL, marine waters include nearshore waters, the continental shelf and oceanic waters. This region covers a total area greater than 2.5 million km^2 and is represented by extensive coastal forms, offshore banks, slopes and canyons. Depending on the season, small parts of this region may be covered in ice (Fig. 30).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Projection: Lambert Conformal Conic (CSRS)

Figure 30. Map of marine waters in MBU 10 NL.

There are 30 priority bird species found in the marine waters of MBU 10 NL (Table 13): 11 waterfowl, 18 waterbirds and 1 landbird. Of these, 3 are species at risk. Priority bird species are found in nearshore waters, on the continental shelf, ocean waters and non-specific marine waters (Table 13).

Contamination and habitat degradation from industrial and military effluents (threat sub-category 9.2) was identified as a very high magnitude threat to priority bird species in the marine waters of MBU 10 NL (Fig. 31). This threat includes habitat degradation, lethal and/or sublethal effects due to oil spills and discharges from drilling platforms or ships, heavy metal contamination (e.g., cadmium from feeding on contaminated mussels, mercury contamination from fish, bioaccumulation of heavy metals from consumption of accumulated prey), and chemical contamination (e.g., bioaccumulation of contaminated water and sediments, biomagnification of toxins from contaminated prey). High magnitude threats were identified as reductions in survival or habitat degradation from competition with commercial fisheries for prey, reductions in prey abundance or a collapse of fishing stocks near colonies, and mortality due to entanglement in fishing gear (5.4 Fishing & harvesting aquatic resources); and a lack of knowledge of priority bird species' distribution, abundance and trends (12.1 Information lacking; Fig. 31).

Many bird species will benefit from the conservation objectives and actions presented in Table 14. The recommended conservation actions to address very high, high or medium-ranked threats in marine waters of MBU 10 NL include: maintaining and improving effectiveness of environmental emergency intervention programs run by the Regional Environmental Emergencies Team and Environment Canada; maintaining and improving Environment Canada's Birds Oiled at Sea (BOAS) program; deterring the dumping of oily ship wastes into the ocean by continuing to enforce federal legislation; improving water quality in marine areas by reducing the use of heavy metals and other pollutants leaching into the environment; prevention, recovery and disposal of derelict fishing gear through increased public awareness and education; regulating the adoption of modifications to fishing gear to reduce bycatch as a condition of licensing; and implementing beneficial management practices (e.g., National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries; Department of Fisheries and Oceans 2007). The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and trends of priority bird species (see Research and Population Monitoring Needs). Conservation actions for low-ranked threats to priority bird species in marine waters are available in the national database but are not presented in this document.

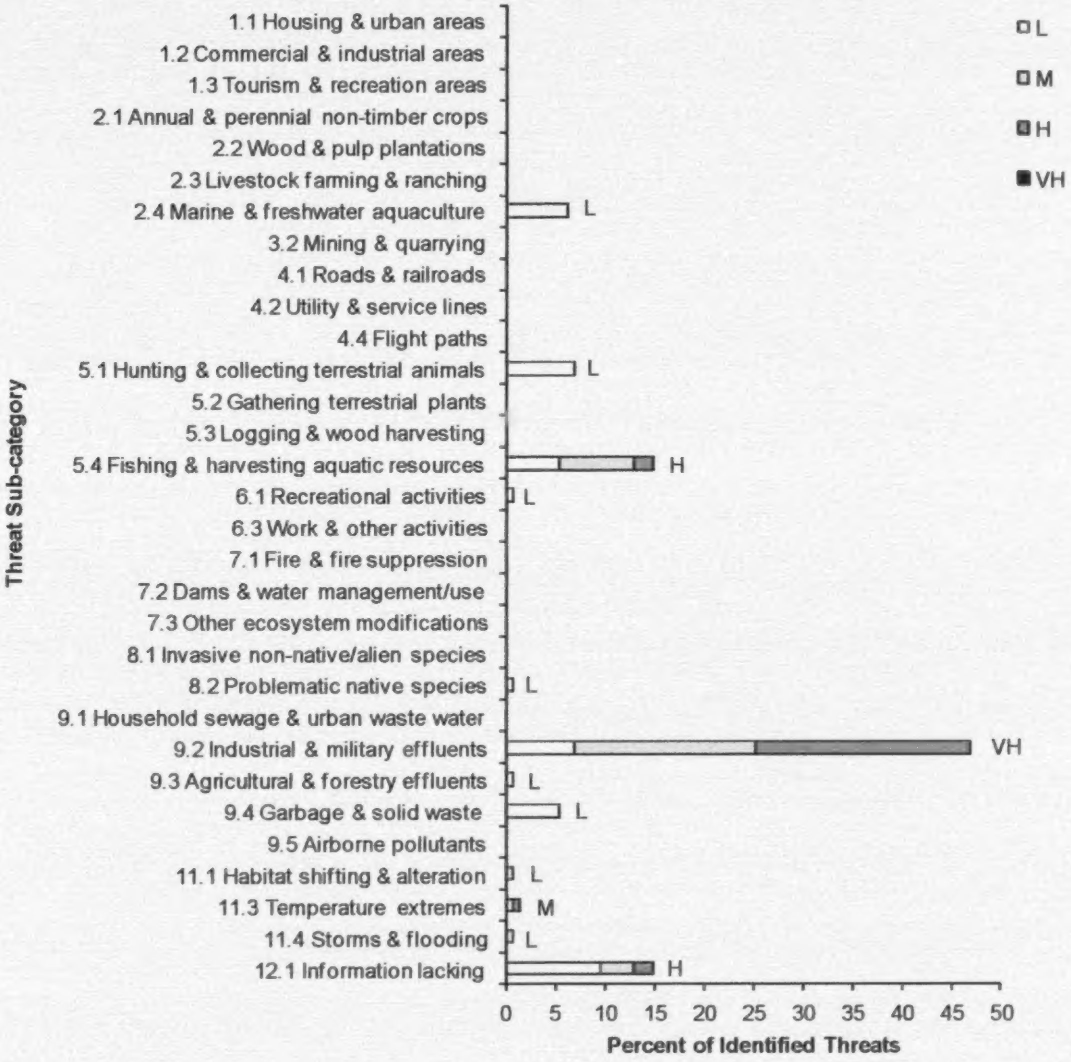
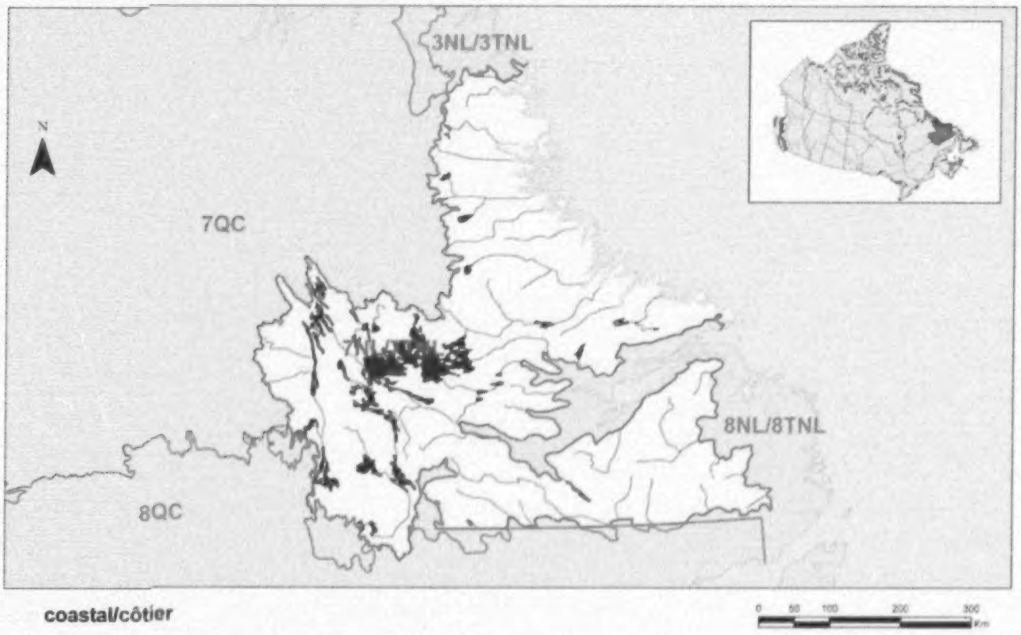


Figure 31. Percent of identified threats to priority bird species in marine waters for each threat sub-category in MBU 10 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in marine waters (for example, if 100 threats were identified in total for all priority species in marine waters, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in marine waters is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority species within MBU 10 NL by threat category and broad habitat class). **Note:** Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Coastal (Above High Tide)

In BCR 7 NL, coastal habitat, defined here as occurring above the high-tide line, include beaches, estuaries, saltmarshes and bare areas found next to large bodies of water (Fig. 32). Coastal habitats occurring below the high-tide line are discussed separately in the next section: Coastal (intertidal) – Newfoundland-Labrador Shelves.



Sources: Atlas of Canada 1,000,000 National Framework Data - Hydrology (CCRS, 2008)
Données-cadre nationales de l'Atlas du Canada à l'échelle du 1/1 000 000 - Hydrologie (CCT, 2008)

Projection: UTM 20 (NAD 1983)

Figure 32. Map of coastal (above high tide) habitats in BCR 7 NL.
Note: The red line delineates the geographic boundaries established by the North American Bird Conservation Initiative for the BCRs. In this document, the boundaries of the terrestrial unit (BCR 7 NL) do not extend below the high-tide line.

There are 15 priority bird species found in coastal (above high tide) habitats within BCR 7 NL (Table 13): 5 waterfowl, 2 waterbirds, 4 shorebirds and 4 landbirds. Of these, 3 are species at risk. Nearly half of the priority bird species are found in estuaries, while the remaining use saltmarshes, beaches and/or bare areas (Table 13). Thirteen of these priority bird species are associated exclusively with one of these sub-habitats, while the American Black Duck uses both estuaries and saltmarshes, and both the American Golden-Plover and Whimbrel use beaches and estuaries (Table 13). There are 9 species that are associated specifically with coastal (above high tide) habitats and are not found in the marine biogeographic unit: American Golden-Plover, Green-winged Teal, Gyrfalcon, Least Sandpiper, Merlin, Peregrine Falcon (*anatum/tundrius*), Semipalmated Sandpiper and Short-eared Owl.

Several high magnitude threats to priority bird species in coastal (above high tide) habitats in BCR 7 NL were identified and include: a lack of knowledge of priority bird species distribution, population abundance and trends (12.1 Information lacking); habitat loss or degradation from changes in habitat structure (e.g., drying), shifts in species' ranges, altered timing of seasonal cues (e.g., egg laying) and food webs (e.g., prey distribution, abundance, species) due to climate change (11.1 Habitat shifting & alteration); and habitat degradation and reduction in survival from increased frequency and severity of storms (11.4 Storms & flooding; Fig. 33). Low magnitude threats that were frequently identified include lethal/sublethal effects due to oil spills or discharges from ships and drilling platforms, and heavy metal contamination such as mercury, PCBs, cadmium lead or mining effluents (9.2. Industrial & military effluents); and legal hunting, poaching of eggs and nestlings or incidental take (5.1 Hunting & collection of terrestrial animals; Fig. 33).

Recommended conservation objectives and actions for threats ranked "medium" or higher are not presented in this section, as they relate to climate change and research/monitoring needs, which are instead presented in the Widespread Issues section of this document. According to methods outlined in Kennedy et al. (2012), conservation actions recommended for low-ranked threats to priority bird species in coastal (above high tide) habitats are not presented in this document but are available in the national database.

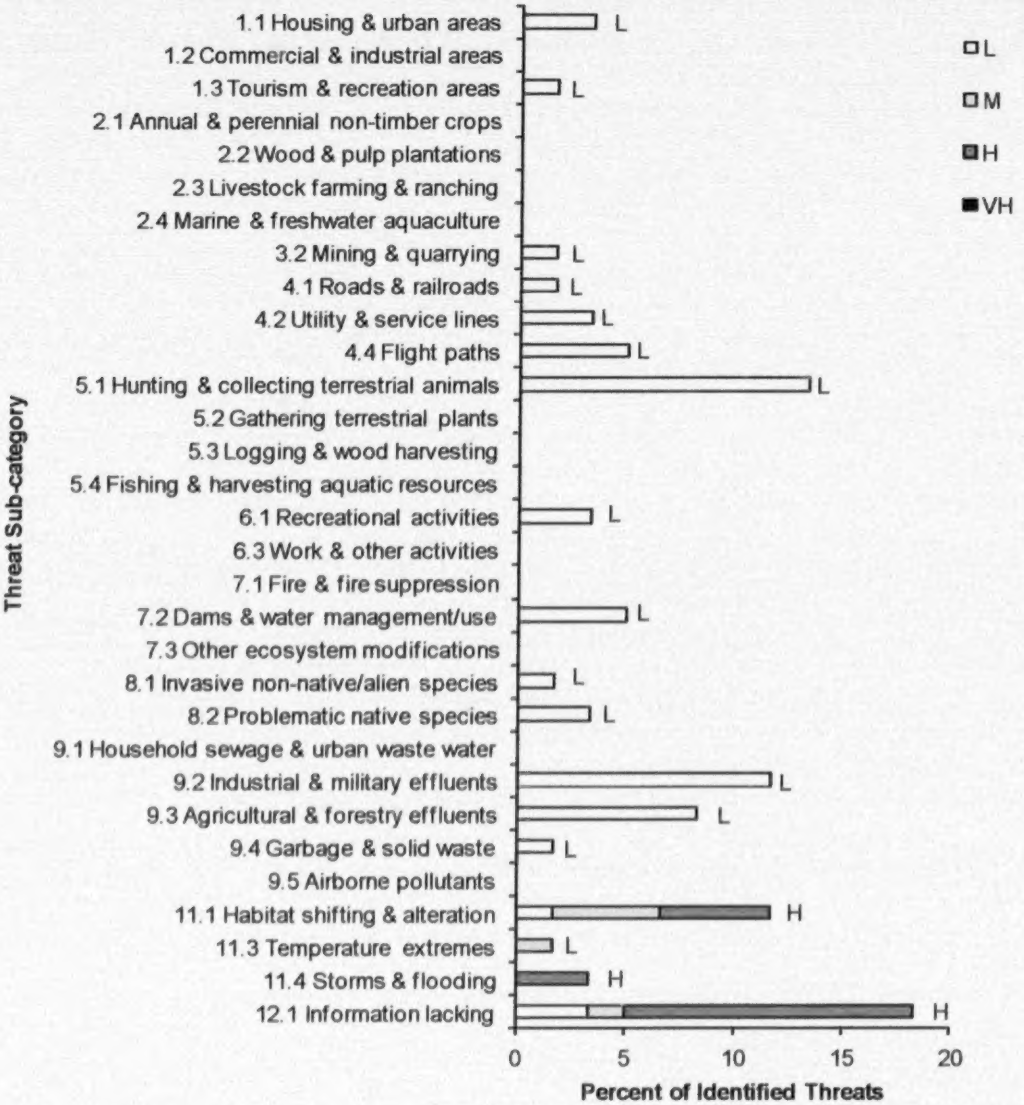


Figure 33. Percent of identified threats to priority bird species in coastal (above high tide) habitats for each threat sub-category in BCR 7 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in the coastal (above high tide) habitats (for example, if 100 threats were identified in total for all priority bird species in coastal [above high tide] habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in coastal (above high tide) habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 7 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 13. Priority species in MBU 10 NL that use marine waters, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
American Black Duck	nearshore waters		Maintain current		Y				Y	
Atlantic Puffin	continental shelf; nearshore waters; oceanic waters		Maintain current							Y
Barrow's Goldeneye (Eastern)	nearshore waters	ice-free, protected rocky shorelines	Recovery objective	Y	Y				Y	
Black Scoter	nearshore waters	shallow, cobbles, coastal islands, eel grass, mud/sand flats, mollusc beds	Assess/Maintain		Y				Y	
Black-legged Kittiwake	continental shelf; nearshore waters; oceanic waters	upwellings, ice edges	Maintain current			Y		Y		
Common Eider	continental shelf; nearshore waters	polynyas, ice edges and open leads, small coastal islands, rocky coastlines, reefs and shallow waters, mollusc beds	Increase 100%		Y				Y	
Common Goldeneye	nearshore waters	coastal bays, sandy, gravel, rocky or boulder substrates	Assess/Maintain		Y			Y	Y	
Common Loon	nearshore waters	bays and inlets, abundant fish	Assess/Maintain		Y			Y		
Common Merganser	nearshore waters	bays, eel grass, mud/sand flats	Assess/Maintain					Y	Y	
Common Murre	continental shelf; oceanic waters	along shelf, fronts, large coastal bays, islands	Assess/Maintain		Y					
Common Tern	continental shelf; nearshore waters	shallow areas, clear waters for foraging	Assess/Maintain		Y			Y		

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and in Appendix 2.

Table 13 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
Cory's Shearwater	continental shelf; oceanic waters	warmer waters	Assess/Maintain		Y					
Dovekie	continental shelf; oceanic waters	upwellings/fronts, continental shelf edges, offshore pack ice, cold waters, large coastal bays	Assess/Maintain		Y					
Great Shearwater	continental shelf; oceanic waters	upwellings/fronts	Assess/Maintain		Y	Y		Y		
Great Skua	oceanic waters	lack of information, ocean habitat usage tied to food source	Assess/Maintain		Y					
Harlequin Duck (Eastern)	nearshore waters	shallow, rocky coastlines and reefs, estuaries	Assess/Maintain	Y	Y				Y	
Ivory Gull	continental shelf; oceanic waters	pack ice and polynyas	Recovery objective	Y	Y					
King Eider	continental shelf; nearshore waters	pack ice and polynyas, deep fjords and bays, soft bottom, mollusc beds	Assess/Maintain		Y				Y	
Leach's Storm-Petrel	oceanic waters	upwellings/fronts	Assess/Maintain		Y					
Long-tailed Duck	continental shelf; nearshore waters	ice edges, coastal lagoons and bays, deep waters	Assess/Maintain		Y				Y	
Manx Shearwater	continental shelf; oceanic waters	upwellings and productive mixing zones	Assess/Maintain		Y					
Northern Gannet	continental shelf; nearshore waters	continental shelf and slope, shoaling fish	Maintain current			Y		Y		
Razorbill	continental shelf; nearshore waters	sea ice free, estuaries, rocky coastlines, upwellings/fronts	Assess/Maintain		Y					
Red-necked Grebe	nearshore waters	shallow bays and inlets	Assess/Maintain		Y		Y			
Red-throated Loon	nearshore waters	sheltered, shallow, sandy substrates	Assess/Maintain		Y					
Snowy Owl	non-specific marine waters	sea ice, snow covered landscapes	Maintain current			Y				
Sooty Shearwater	continental shelf; oceanic waters	upwellings/fronts	Assess/Maintain		Y					
Surf Scoter	nearshore waters	shallow eel grass, mud/sand flats, mollusc beds, reefs	Assess/Maintain		Y				Y	

Table 13 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
Thick-billed Murre	continental shelf; oceanic waters	ice, upwellings/fronts, large coastal bays	Assess/Maintain		Y					
White-winged Scoter	nearshore waters	shellfish beds, sand or gravel bottoms, shallow	Assess/Maintain		Y				Y	

Table 14. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for marine waters in MBU 10 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality due to entanglement in fishing gear.	5.4 Fishing & harvesting aquatic resources	Reduce the number of birds killed directly or indirectly from fishing	2.4 Reduce incidental mortality	Recover and dispose of derelict fishing gear.	2.3 Habitat and natural process restoration	High: Common Murre Razorbill Thick-billed Murre Medium: Atlantic Puffin Common Eider Cory's Shearwater Great Shearwater Great Skua Long-tailed Duck Northern Gannet Sooty Shearwater Surf Scoter
				Prevent derelict fishing gear through increased public awareness and education.	4.3 Awareness and communications	
				Alter fishing practices to avoid peak areas and periods of bird foraging.	5.2 Policies and regulations	
				Regulate the adoption of fishing gear modifications to reduce bycatch as a condition of licensing.	5.2 Policies and regulations	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
				Prevent derelict fishing gear through regulation.	5.2 Policies and regulations	
Habitat degradation due to competition with commercial fisheries for prey.	5.4 Fishing & harvesting aquatic resources	Reduce competition for resources between priority species and human commercial operations in marine waters	5.3 Reduce human competition for food sources or foraging sites	Alter fishing practices to avoid peak areas and periods of bird foraging.	5.2 Policies and regulations	Medium: Atlantic Puffin Black-legged Kittiwake

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[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 14 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality due to oil discharges from ships.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by reducing deliberate dumping of oily ship wastes into the ocean	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and Environment Canada.	2.3 Habitat and natural process restoration	High: American Black Duck Atlantic Puffin Barrow's Goldeneye (Eastern) Black Scoter Common Loon Common Merganser Common Murre Common Tern Cory's Shearwater Dovekie Great Shearwater Great Skua Harlequin Duck (Eastern) King Eider Northern Gannet Razorbill Red-necked Grebe Red-throated Loon Surf Scoter White-winged Scoter Medium: Black-legged Kittiwake Common Goldeneye Ivory Gull Leach's Storm-Petrel Long-tailed Duck Manx Shearwater Sooty Shearwater Thick-billed Murre
				Maintain/improve Environment Canada's Birds Oiled at Sea (BOAS) program	2.3 Habitat and natural process restoration	
				Deter the dumping of oily ship wastes into the ocean by enforcing federal legislation.	5.4 Compliance and enforcement	
Mortality due to oil spills from drilling platforms.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by maintaining/ improving	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and Environment Canada.	2.3 Habitat and natural process restoration	High: Atlantic Puffin Barrow's Goldeneye (Eastern) Black Scoter Common Merganser Cory's Shearwater Dovekie

Table 14 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
		emergency intervention programs		Maintain/improve Environment Canada's Birds Oiled at Sea (BOAS) program	2.3 Habitat and natural process restoration	Great Shearwater Harlequin Duck (Eastern) King Eider Surf Scoter White-winged Scoter Medium: Black-legged Kittiwake Common Goldeneye Common Loon Common Murre Common Tern Ivory Gull Leach's Storm-Petrel Long-tailed Duck Manx Shearwater Northern Gannet Red-necked Grebe Red-throated Loon Sooty Shearwater Thick-billed Murre
Habitat degradation due to chemical contamination	9.2 Industrial & military effluents	Reduce the impact of chemical contaminants in marine waters	1.5 Reduce habitat degradation from contaminants	Maintain/restore marine waters by reducing the use of pollutants leaching into the environment	2.3 Habitat and natural process restoration	Medium: Leach's Storm-Petrel
Lethal/sublethal effects due to chemical or heavy metal contamination	9.2 Industrial & military effluents	Reduce mortality of birds caused by chemical contaminants	2.2 Reduce mortality and/or sub-lethal effects from exposure to contaminants	Maintain/restore marine waters by reducing the use of pollutants leaching into the environment	2.3 Habitat and natural process restoration	High: Ivory Gull Medium: Barrow's Goldeneye Black Scoter Common Eider White-winged Scoter

Table 15. Priority species in BCR 7 NL that use coastal (above high tide) habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
American Black Duck	estuaries; saltmarshes		Maintain current		Y				Y	
American Golden-Plover	beaches; estuaries	beaches and mudflats	Assess/Maintain		Y			Y		
Canada Goose (North Atlantic)	estuaries; saltmarshes		Increase 50%		Y				Y	
Common Goldeneye	estuaries		Maintain current		Y				Y	
Common Loon	estuaries	abundant fish	Assess/Maintain		Y					
Common Tern	beaches	sand and gravel, scattered vegetation (cover for chicks)	Assess/Maintain		Y					
Green-winged Teal	saltmarshes	shallow	Increase 50%						Y	
Gyrfalcon	beaches; islands	congregation of shorebirds, waterfowl and gulls, including mudflats	Maintain current			Y		Y		
Harlequin Duck (Eastern)	estuaries		Assess/Maintain	Y	Y				Y	
Least Sandpiper	estuaries	short grasses	Assess/Maintain		Y					
Merlin	bare areas	congregated shorebirds along tidal flats and beaches	Maintain current					Y		
Peregrine Falcon (*anatum/tundrius*)	bare areas	steep cliffs, crevices, islands	Assess/Maintain	Y		Y				
Semipalmated Sandpiper	beaches	sand dunes, scattered waterbodies	Assess/Maintain		Y			Y		
Short-eared Owl	bare areas	above treeline, open, small mammal abundance	Assess/Maintain	Y	Y			Y		
Whimbrel	beaches; estuaries		Assess/Maintain		Y			Y		

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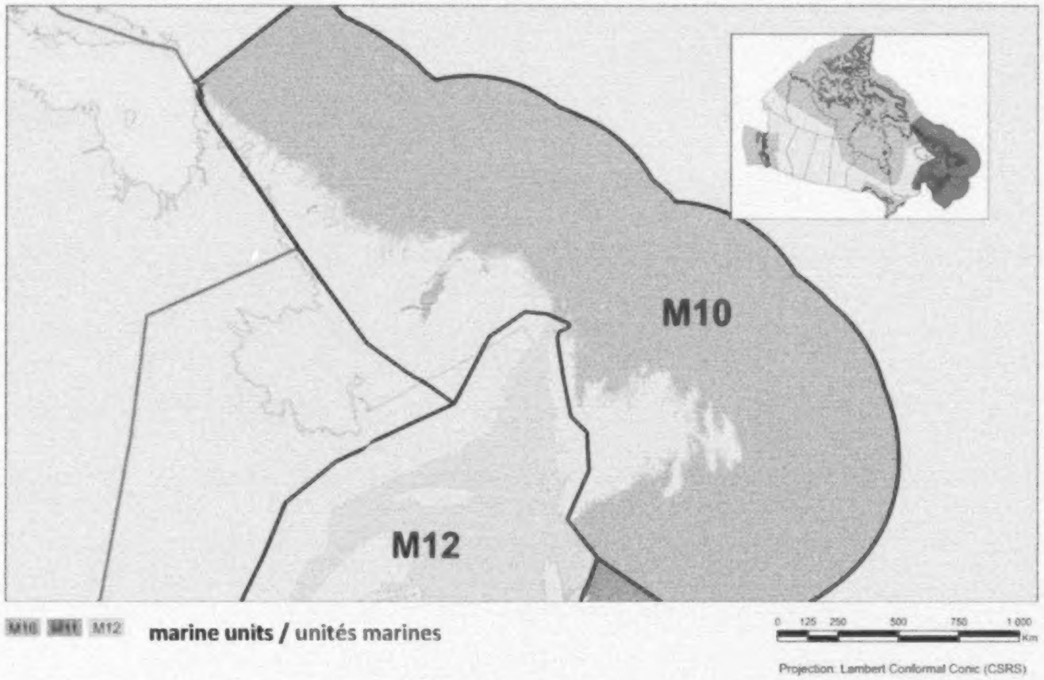
[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and in Appendix 2.

Coastal (Intertidal) – Newfoundland-Labrador Shelves

In MBU 10 NL, coastal habitats include estuaries, islands, bare areas, mudflats, rocky shoreline, saltmarshes and sandflats (Fig. 34). The coastal (intertidal) habitats within MBU 10 NL include all marine habitats along ocean shorelines but do not include terrestrial shoreline habitats (Fig. 34). Priority bird species using primarily coastal (above high tide) habitats are included in the previous section: Coastal (Above High Tide).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Projection: Lambert Conformal Conic (CSRS)

Figure 34. Map of coastal (intertidal) habitats in MBU 10 NL.

There are 28 priority bird species found in coastal (intertidal) habitats in MBU 10 NL (Table 16): 9 waterfowl, 11 waterbirds and 8 shorebirds. Of these, 4 are species at risk. Priority bird species are found in multiple sub-habitats such as estuaries, saltmarshes, islands, mudflats, rocky shorelines, sandflats and non-specific bare areas (Table 16). Eighteen priority bird species are associated exclusively with one sub-habitat, while the remaining species use a combination of sub-habitats (Table 16). Ten species are associated specifically with the Newfoundland-Labrador Shelves coastal (intertidal) habitat, which are not found in coastal habitats in BCR 7 NL: Atlantic Puffin, Common Loon, Common Merganser, Common Murre, Long-tailed Duck, Manx Shearwater, Northern Gannet, Razorbill, Solitary Sandpiper and Thick-billed Murre.

Several high magnitude threats to priority bird species in coastal (intertidal) habitats in MBU 10 NL were identified and include: a lack of knowledge of priority bird species' distribution, abundance and trends (12.1 Information lacking); habitat degradation due to climate change altering habitat structures such as beaches, dunes, tidal currents and amplitudes (11.1 Habitat shifting & alteration); and reductions in fecundity from hybridization with Mallards and mortality from introduced and increased predator populations due to anthropogenic land use modifications (8.2 Problematic native species; Fig. 35). Medium magnitude threats identified were habitat degradation, lethal and/or sublethal effects due to chemical or heavy metal contamination in addition to oil spills and discharges from ships and drilling platforms (9.2 Industrial & military effluents); reductions in survival from introduced predators such as mink, hares and voles on breeding colony islands (8.1 Invasive non-native/alien species); habitat loss and degradation from increased frequency and severity of storms leading to erosion, rock slides and flooding (11.4 Storms & flooding); and a reduction in chick and adult survival of piping plovers (*melodus*) from cold snaps during breeding season (11.3 Temperature extremes; Fig. 35). The following threats were ranked "low" overall; however, the threat related to mortality due to entanglement in fishing gear (5.4 Fishing & harvesting aquatic resources) was ranked as "medium" for the Long-tailed Duck, while the threat related to the reduction in fecundity due to disturbance (e.g., motor boats, human activities near colonies) around nesting sites (6.1 recreational activities) was ranked "medium" for the Common Eider, Common Loon, Common Tern and Piping Plover (*melodus*). Another threat that was frequently identified but ranked as "low" overall was legal hunting, poaching and incidental take (5.1 Hunting & collecting terrestrial animals; Fig. 35).

Many bird species will benefit from the conservation objectives and actions presented in Table 17. Examples of recommended conservation actions to address medium and high-ranked threats in coastal (intertidal) habitats are to assess the impact of predation by introduced predators on the survival of priority species and maintain existing predator control programs or evaluate the possibility of starting new ones; maintain/improve Environment Canada's Birds Oiled at Sea (BOAS) program; maintain/improve effectiveness of environmental emergency intervention programs run by the Regional Environmental Emergencies Team and Environment Canada; deter the dumping of oily ship wastes into the ocean by continuing to enforce federal legislation; and maintain/restore coastal areas by reducing the use of pollutants or heavy metals leaching into the environment. The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and trends of priority bird species (see Research and Population Monitoring Needs). Recommended conservation actions to address climate change are presented in the Widespread Issues section of this document (see Climate Change). Conservation actions for low-ranked threats to priority bird species in coastal (intertidal) habitats are available in the national database but are not presented in this document.

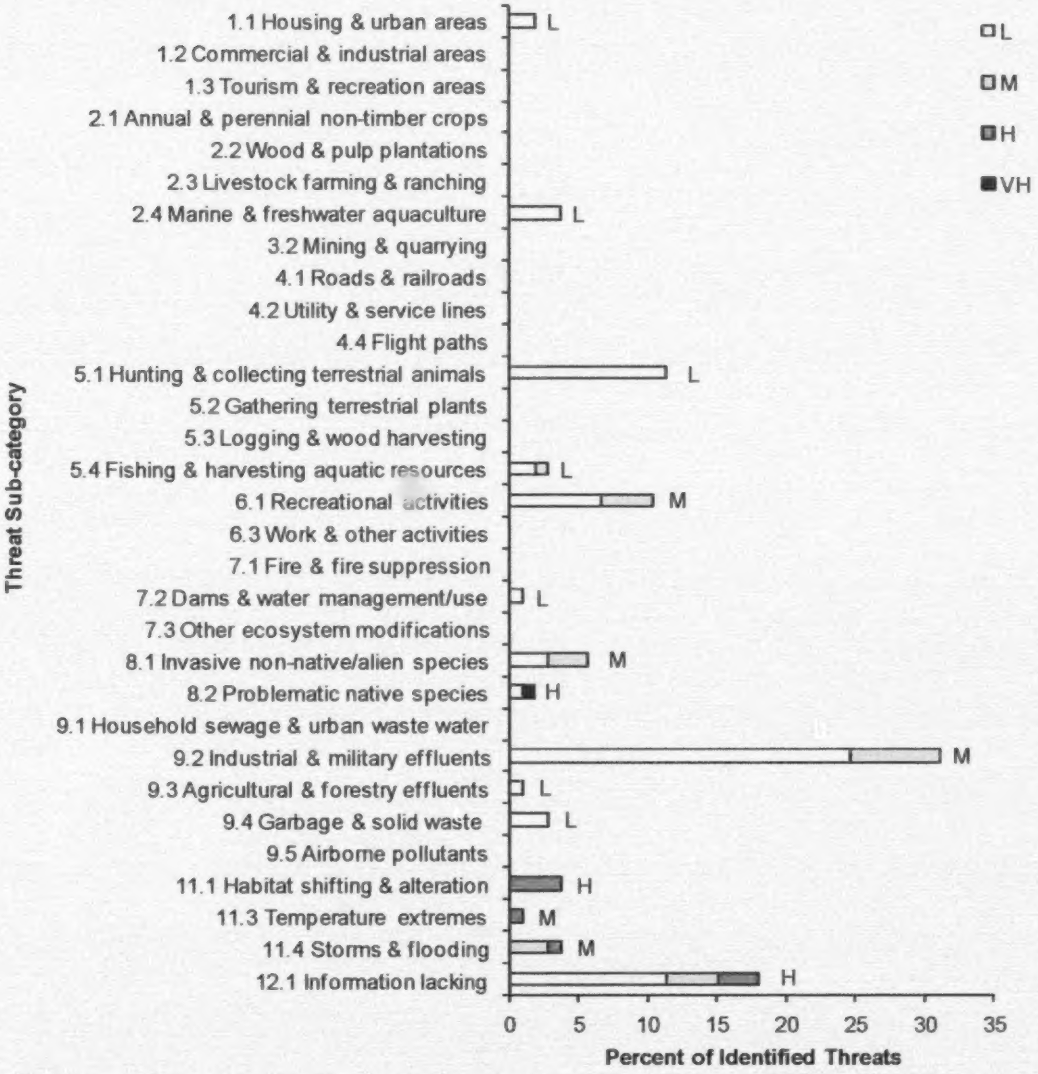

Figure 35. Percent of identified threats to priority bird species in coastal (intertidal) habitats in each threat sub-category of MBU 10 NL.

Each bar represents the percent of the total number of threats identified for each sub-threat category in coastal (intertidal) habitats (for example, if 100 threats were identified in total for all priority species in coastal (intertidal) habitats, and 10 of those threats were in the category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M, H and VH rankings in the sub-category). The overall magnitude of the sub-threat in coastal (intertidal) habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority species within MBU 10 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Section 3: Additional Issues

Widespread Issues

Some well-known conservation issues may not be identified in the literature as significant threats to populations of an individual priority species and therefore may not be captured in the threat assessment. However, these issues, while they may or may not be limiting factors for any individual species or population, contribute to avian mortality or decreases in fecundity across many species and thus warrant conservation attention. Usually these issues transcend habitat types and are considered "widespread". Examples of these issues include:

- Collisions with artificial structures (buildings, cars, utility/telecommunications towers and lines, etc.)
- Predation by domestic cats
- Pollution/pesticides/oil spills
- Climate change

Because the widespread issues do not fit into the standard presentation format used in the BCR strategies, they are presented separately here. The mortality estimates included here are largely based on draft reports that were available within Environment Canada when this strategy was produced; the numbers may change as the final scientific papers are peer-reviewed and published. Human-related avian mortality across all sectors was standardized and compared by Calvert et al. (2013).

These widespread issues are not presented in any particular order, as their relative importance in Newfoundland and Labrador or within BCR 7 NL and MBU 10 NL is not known.

Collisions

Buildings

Collisions with glass windows or reflective panels on buildings are believed to be a significant source of bird mortality in Canada. Estimates of mortality from collisions with houses in Canada (including birds using feeders) range from approximately 15.8–30.5 million birds per year (Machtans et al. 2013). Mortality from collisions with buildings of fewer than 12 storeys is estimated at approximately 0.3–11.4 million birds/year, and for all cities in Canada with tall buildings in an urban core the estimate is 13 000 – 256 000 birds/year (Machtans et al. 2013). The total estimate of mortality from collisions with buildings in Canada is therefore between 16.1 and 42.2 million birds/year (Machtans et al. 2013).

Data from Canada and the northeastern United States reveal that 163 species of birds of 32 families are known to have been killed by buildings. Some families and species of birds are disproportionately affected by collisions with buildings. Parulidae (warblers), Fringillidae (sparrows and allies) and Regulidae (kinglets) account for 70% of all bird deaths; the species most frequently killed are White-throated Sparrows (13.5% of all reported deaths), Golden-crowned Kinglets (10.2%), Dark-eyed Juncos (6.1%), Ovenbirds (5.3%) and Ruby-crowned

Kinglets (5.3%). The population-level effects of bird mortality from building strikes are unknown. In BCR 7 NL and MBU 10 NL, no threats from collisions with buildings were identified for any individual priority bird species. Very low human population densities and the absence of extensive urban development no doubt limit the influence of this threat category in BCR 7 NL and MBU 10 NL. No conservation objectives or actions are mentioned in Table 18 as this threat was considered too low in the region.

Wind Turbines

The 2 955 wind turbines in Canada in 2011 have drawn considerable attention for their potential to cause mortality to birds and other species (notably bats). Two sources of mortality are typically associated with wind turbines: collisions with the turbines themselves, and the destruction of nests by turbine construction activities during the breeding season. On average, approximately 5.9 birds are killed per turbine per year. Scaling up to a national level, an estimated 16 700 birds (between 13 300 and 21 600) die from collisions with wind turbines each year (Zimmerling et al. 2013).

Some species are particularly vulnerable to collisions with wind turbines, for example, raptors flying along a land/water interface. For smaller, more common passerine species (warblers, thrushes, kinglets, etc.), the relatively small number of birds affected does not appear to pose a population-level threat. However, the anticipated proliferation of wind turbines means that we should continue to ensure that turbines are sited to avoid important bird habitats and migration corridors.

At the 43 wind farms in Canada for which data are available, total habitat loss per turbine is 1.23 ha on average. Based on this average, the predicted total habitat loss for wind farms nationwide is 3 635 ha. Using published estimates of nest densities, the total number of affected nests, not accounting for construction that might occur outside the breeding season, is approximately 5 700 (Zimmerling et al. 2013).

In BCR 7 NL and MBU 10 NL, no threats from collisions with wind turbines were identified for any individual priority bird species. There are currently no wind farms in Labrador; however, there is a proposal associated with the Lower Churchill development project that may pose threats to birds with increased development of this energy sector in Newfoundland and Labrador. No conservation objectives or actions are mentioned in Table 18, as this threat was considered too low in the region.

Communication Towers

There are currently almost 8 000 communication towers in Canada > 60 m high (Longcore et al. 2012), each of which can pose a hazard to birds during migration. Birds are attracted to the lights of communication towers and are killed when they collide with the structures and guy wires. Mortality increases exponentially with tower height, in part because the use of guy wires also increases with tower height. Poor weather also plays a significant role in increasing migrant fatality; foggy and cloudy conditions increase the lit area around towers and block celestial clues used by migrating birds. The result is that birds circle to exhaustion in the halo of artificial light, or collide with each other, the tower or its guy wires (American Bird Conservancy 2012).

Avian mortality at towers is unequally distributed among species and regions, but estimates suggest that over 220 000 birds are killed in Canada each year (Table 18; Longcore et al. 2012). In all of BCR 7, collisions with towers are estimated to kill approximately 2 754 birds every year (Longcore et al. 2012).

Neotropical migrants in the families Parulidae (wood-warblers) and Vireonidae (vireos) are the species most commonly killed by communication towers. These families include threatened species and many that are of conservation concern in Canada and/or the United States. When considered in concert with mortality at towers in the United States (which is 20 times higher due to the larger number and greater height of towers in the United States), and the mortality from other stationary structures, mortality from collisions with communications towers may negatively affect the population trends of some birds. See Table 18 for conservation objectives and actions.

Power Lines

Birds may be killed by colliding with power lines, or they may be electrocuted. Species with high wing-loading and thus low maneuverability, such as waterfowl, appear particularly at risk for collisions (Bevanger 1998). Electrocutions are most likely for large birds such as raptors and herons, whose bodies are large enough to span the distances between wires and create a short circuit. Raptors' habit of using power poles as perches further increases their risk. However, estimates of total mortality due to collisions and electrocutions can vary widely (Manville 2005), and population-level impacts are difficult to determine. The generation and distribution of electricity in Labrador is provided primarily by Newfoundland and Labrador Hydro. There are more than 8 000 km of power lines in the province, including over 3 600 km of distribution lines and over 4 700 km of transmission lines (Newfoundland and Labrador Hydro 2013). In BCR 7 NL, there are also power lines associated with the Churchill Falls site, and new lines associated with the development on the Lower Churchill.

Canadian estimates are that 161 000 – 802 000 birds are killed annually by electrocution and another 5.3–20.6 million birds are killed each year by colliding with electrical transmission lines (Calvert et al. 2013). See Table 18 for conservation objectives and actions.

Vehicles

There are over 1.4 million km of roads and hundreds of airports in Canada (World Bank Indicators 2012) which are often bordered by fences and vegetation that provide convenient places for birds to perch, forage and nest. The paved surfaces can attract birds through the heat they emit, the puddles that form beside roads, and the salt and grit used for de-icing. Road infrastructure is minimal in BCR 7 NL, with the primary public road, and one of the few in this part of the province, being the Trans-Labrador Highway, covering a distance of approximately 1 160 km throughout Labrador (about half of which is located in BCR 7 NL). The provincial government is also responsible for nearly 260 km of community access and local roads (NL

Department of Transportation and Works 2006). Current estimates for one- and two-lane paved roads outside of major urban centres in Canada are that between 4.65 and 13.8 million birds are killed annually (Bishop and Brogan 2013).

Bird collisions with cars are influenced by the location of the road, proximity of vegetation and vehicle speed. Raptors and owls that hunt and forage near roads are particularly vulnerable, but many species that forage for grit and road salt or are otherwise attracted to roads have a high likelihood of being hit by vehicles. The population-level effects of this source of mortality are not known. See Table 18 for conservation objectives and actions.

Predation by Domestic Cats

Based on the number of pet cats in Canada and published kill rates by cats elsewhere, roughly 204 million birds (between 105 and 348 million) are killed by domestic and feral cats in Canada each year (Blancher 2013). The broad range on this estimate reflects imprecise information on the average number of bird kills per cat, especially for rural and feral cats, and a lack of information on the number of feral cats (versus owned or pet cats) in Canada.

The birds most susceptible to cat predation are those that nest or forage on or near the ground, or spend substantial time in human-dominated landscapes (both rural and urban) where cats are abundant. The proportion of Canada's birds killed by cats would be higher if additional cat predation when migrating through, or wintering in, the United States is factored in.

Without detailed study of the individual species affected, it is difficult to assess whether mortality caused by cat predation impacts population trends of birds in Canada. Nevertheless, it is likely that many species of birds are potentially vulnerable to population effects at the local scale in southern Canada.

In BCR 7 NL, predation by domestic cats was a threat identified for the Merlin in coniferous, shrub/early successional, riparian and coastal (above high tide) habitats, as well as for the Common Nighthawk in urban habitats. Very limited urban and suburban development in this BCR is likely to reduce the magnitude of this threat to birds in BCR 7 NL. See Table 18 for conservation objectives and actions.

Pollution

Pollution caused by industrial chemicals, pesticides and heavy metals can have both direct and indirect effects on survival and reproduction in birds. Sometimes the effects of exposure to pollutants are unexpected and do not result in immediate, measurable impacts on bird populations (Eeva and Lehikoinen 2000, Franceschini et al. 2008, North American Bird Conservation Initiative, U.S. Committee 2009, Mineau 2010). However, persistent exposure can result in sharp declines in bird populations, as happened with Peregrine Falcons in eastern Canada prior to the ban of DDT. See Table 18 for conservation objectives and actions.

Pesticides

The most recent estimate suggests that 0.96–4.4 million birds are killed by pesticides annually in Canada (Mineau 2010). Provinces such as Saskatchewan, which have a large agricultural land base, account for the majority of the estimated kill, and pesticides are thought to be an important contributor to the decline in grassland bird species in Canada (Mineau 2010). Pesticides can kill birds rapidly following contact or may have sub-lethal impacts such as suppressed immune function and reduced stress response. There may also be indirect effects of pesticides such as reduction in prey and changes in vegetation that reduce habitat quality. While the use of the many toxic pesticides has been eliminated in Canada, migratory birds are still exposed while on wintering grounds in countries where their use is still permitted (Mineau 2010).

In BCR 7 NL, pesticide use is limited due to the small footprint of the forestry and agriculture industries, as well as the remote location and low human population densities. Additionally, Newfoundland and Labrador Hydro will occasionally use herbicides to control vegetation growth under their power lines. Habitat degradation and lethal/sublethal effects from chemical contamination of pesticides were identified as a threat for 12 priority bird species in wetlands, inland waterbodies, coastal (above high tide), coniferous, riparian and shrub/early successional habitats. See Table 18 for conservation objectives and actions.

Toxic Chemicals and Heavy Metals

Toxic organic chemicals and heavy metals released into the environment can also negatively impact bird populations. While some industrial chemicals such as PCBs are regulated, there is concern about new chemicals such as flame retardants (PBDE) that are used in computers, car parts and upholstery, and whose effects on wildlife are largely unknown (Environment Canada 2003). Scavengers experience toxic effects when they ingest lead shotgun pellets or bullet fragments embedded in carcasses of game animals, and loons and other waterbirds are exposed to lead from shotgun pellets, sinkers and jigs that they ingest either while collecting grit for their gizzards or by eating bait fish with line and sinker still attached (Scheuhammer and Norris 1996, Scheuhammer et al. 2003). In some areas, lead poisoning from sinkers and jigs can account for approximately half of the mortality of adult Common Loons on their breeding grounds (Scheuhammer and Norris 1996). Birds are also susceptible to bioaccumulation of other toxic metals such as methylmercury, selenium and others when they consume prey that has been exposed to these substances.

Lethal/sublethal effects due to chemical or heavy metal contamination (e.g., consumption and bioaccumulation of contaminated water and sediments, exposure to pollutants at industrial discharge sites such as mining effluents, mercury, PCBs), as well as habitat degradation due to chemical contamination leading to acidification or alterations in water chemistry, were identified as threats to 11 priority species in BCR 7 NL and 13 priority species in MBU 10 NL in the following habitat classes: waterbody (inland and marine), riparian, wetland, coastal (above high tide and intertidal) and urban habitats (Table A-3). See Table 18 for conservation objectives and actions.

Oil Pollution

Oil may enter the environment either accidentally, through deliberate dumping, or in contained tailings ponds. It may be a single large event, as occurred in the Gulf of Mexico in 2010, or numerous smaller events. Off the south coast of Newfoundland, it has been estimated that over 300 000 birds are killed by oil spills annually (Wiese and Robertson 2004), largely as a result of deliberate dumping of oily waste by ships. Typically, diving birds are most at risk of oiling; however, any birds that come into contact with oil are vulnerable. Oil can impact birds through direct effects such as hypothermia (resulting from lost waterproofing of feathers following oil contamination) and toxicity (from ingesting oil as they preen or by inhaling volatile organic compounds), as well as indirect effects, such as reduced prey availability and decreased quality of habitat. While techniques exist to clean and rehabilitate oiled birds, many birds die before, during and after rescue attempts (Brown 2003).

Extensive offshore oil and gas exploration and extraction is proceeding in Newfoundland and Labrador. The Grand Banks contain the major oil fields and also support international shipping via marine transport. Given the extensive traffic through or near the MBU 10 NL region, the area is susceptible to oil spills (both accidental and intentional), and not surprisingly, mortality caused by oil spills and discharges was identified as threats to 35 of the 39 priority bird species in MBU 10 NL in coastal (intertidal) habitats and marine waters and also to the Black Scoter in coastal (above high tide) habitats in BCR 7 NL (Table A-3). See Table 18 for a summary of conservation objectives and actions.

Table 16. Priority species in MBU 10 NL that use coastal (intertidal) habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
American Black Duck	estuaries; saltmarshes		Maintain current		Y				Y	
Atlantic Puffin	islands	predator free, tunnels in turf or rock piles	Maintain current							Y
Barrow's Goldeneye (Eastern)	estuaries		Recovery objective	Y	Y				Y	
Black-legged Kittiwake	islands	coastal and island cliffs	Maintain current			Y		Y		
Canada Goose (North Atlantic)	islands; mudflats; saltmarshes	ponds	Increase 50%		Y				Y	
Common Eider	islands; rocky shorelines	dense shrubby forest, well drained, standing fresh water, predator free, exposed	Increase 100%		Y				Y	
Common Goldeneye	estuaries		Assess/Maintain		Y			Y	Y	
Common Loon	estuaries	abundant fish	Assess/Maintain		Y			Y		
Common Merganser	estuaries		Assess/Maintain					Y	Y	
Common Murre	islands	cliffs and flat ground for nesting, mainland coasts and islands	Assess/Maintain		Y					
Common Tern	islands	sand and gravel, scattered vegetation (cover for chicks)	Assess/Maintain		Y			Y		
Harlequin Duck (Eastern)	estuaries; islands; rocky shorelines	rocky shorelines and sub-tidal ledges	Assess/Maintain	Y	Y				Y	
Leach's Storm-Petrel	islands	small, remote, soft substrate, vegetated	Assess/Maintain		Y					

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[1] Reasons for priority status are as follows: SAR, species listed under SARA, assessed by COSEWIC, or listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered, Threatened, Special Concern (SARA/COSEWIC only) or Vulnerable (NL only); N/CC, National/Continental Concern; N/CS, National/Continental Stewardship; R/SC, Regional/Sub-regional Concern; R/SS, Regional/Sub-regional Stewardship; NAWMP/EHJV, waterfowl that are priority under the regional EHJV Implementation Plan 2007-2012 (EHJV 2008) or scored as "Moderately-High", "High" or "Highest" in WCR 7 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004); Review, species added by the NL Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and in Appendix 2.

Table 16 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status[1]						
				SAR	N/CC	N/CS	R/SC	R/SS	NAWMP/ EHJV	Review
Lesser Yellowlegs	mudflats; saltmarshes		Assess/Maintain		Y					
Long-tailed Duck	rocky shorelines	cobble and bedrock ledges; surf along beaches	Assess/Maintain		Y				Y	
Manx Shearwater	islands	soft substrate, open terrain, grasses and/or shrubs	Assess/Maintain		Y					
Northern Gannet	islands	offshore islands, cliffs or flat/sloping bare rock	Maintain current			Y		Y		
Piping Plover (*melodus*)	sandflats	sand, gravel, cobble, ephemeral pools	Recovery objective	Y	Y					
Purple Sandpiper	rocky shorelines	rocky shoreline exposed to wave action	Assess/Maintain		Y					
Razorbill	islands	offshore islands, rock crevices, boulders and steep cliffs	Assess/Maintain		Y					
Red Knot (*rufa*)	non-specific bare areas; saltmarshes	especially sandy bottom estuaries	Assess/Maintain	Y	Y					
Red-necked Grebe	estuaries		Assess/Maintain		Y		Y			
Sanderling	estuaries; sandflats		Assess/Maintain		Y					
Solitary Sandpiper	mudflats; saltmarshes		Assess/Maintain		Y					
Surf Scoter	estuaries; rocky shorelines	mollusc beds, rocky	Assess/Maintain		Y				Y	
Thick-billed Murre	islands	cliffs	Assess/Maintain		Y					
Whimbrel	estuaries; mudflats		Assess/Maintain		Y					
White-rumped Sandpiper	mudflats		Maintain current							Y

Table 17. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions, and priority species affected for coastal (intertidal) habitats in MBU 10 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality due to entanglement in fishing gear.	5.4 Fishing & harvesting aquatic resources	Reduce the number of birds killed directly or indirectly from fishing	2.4 Reduce incidental mortality	Recover and dispose of derelict fishing gear.	2.3 Habitat and natural process restoration	Medium: Long-tailed Duck
				Prevent derelict fishing gear through increased public awareness and education.	4.3 Awareness and communications	
				Alter fishing practices to avoid peak areas and periods of bird foraging.	5.2 Policies and regulations	
				Regulate the adoption of fishing gear modifications to reduce bycatch as a condition of licensing.	5.2 Policies and regulations	
				Implement beneficial management practices	5.3 Private sector standards and codes	
				Prevent derelict fishing gear through regulation.	5.2 Policies and regulations	
Reduction in fecundity due to disturbance around nesting sites (e.g., motor boats, human activities near colonies).	6.1 Recreational activities	Reduce disturbance caused by human development and recreation in coastal habitats	4.1 Reduce disturbance from human recreation	Establish buffer zones around known breeding, foraging, and/or staging areas in coastal habitats.	2.1 Site/area management	Medium: Common Eider Common Murre Common Tern Piping Plover (*melodus*)
				Limit human recreational activities in important breeding colony and stopover coastal habitats during breeding and migration windows.	2.1 Site/area management	
				Limit sources of loud noise and rapidly moving vehicles in sensitive coastal habitats during breeding and migration windows.	2.1 Site/area management	
				Raise public awareness of the vulnerability of these species to human disturbance at breeding, foraging, and/or staging sites.	4.3 Awareness and communications	

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[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 17 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality from introduced mammalian and avian predators (e.g., red squirrels).	8.1 Invasive non-native/ alien species	Reduce or eliminate introduced predators	3.5 Prevent and control the spread of invasive and exotic species	Assess the impact of predation by introduced predators on the survival of priority species.	8.1 Research	Medium: Northern Gannet Leach's Storm-Petrel Razorbill
				Maintain existing predator control programs and evaluate the possibility of starting new ones.	2.2 Invasive/problematic species control	
Mortality due to an increase in predator populations as a result of land use changes.	8.2 Problematic native species	Reduce mortality of priority species due to predation	2.5 Reduce parasitism/ predation	Assess the impact of predation by introduced predators on priority species' survival.	8.1 Research	Very High: Piping Plover (*melodus*)
				Maintain existing predator control programs and evaluate the possibility of starting new ones.	2.2 Invasive/problematic species control	
Mortality due to oil discharges from ships.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by reducing deliberate dumping of oily ship wastes into the ocean	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and Environment Canada	2.3 Habitat and natural process restoration	Medium: Barrow's Goldeneye (Eastern) Common Loon Red-necked Grebe
				Maintain/improve Environment Canada's Birds Oiled at Sea (BOAS) program.	2.3 Habitat and natural process restoration	
				Deter the dumping of oily ship wastes into the ocean by enforcing federal legislation.	5.4 Compliance and enforcement	
Mortality due to oil spills from drilling platforms.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by maintaining/ improving emergency intervention programs	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of emergency intervention programs like the programs run by the Regional Environmental Emergencies Team and Environment Canada.	2.3 Habitat and natural process restoration	Medium: Barrow's Goldeneye (Eastern) Common Loon Harlequin Duck (Eastern) Red-necked Grebe
				Maintain/improve Environment Canada's Birds Oiled at Sea (BOAS) program.	2.3 Habitat and natural process restoration	

Table 18. Conservation objectives and actions associated with bird mortality from collisions, cat predation and contaminants in BCR 7 NL and MBU 10 NL.

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
Collision Mortality						
Collisions with communications towers cause bird mortality, particularly during migration.	1.2 Commercial and industrial areas	Reduce incidental mortality from collisions with artificial structures	2.7 Reduce incidental mortality from collisions.	Follow beneficial management practices for reducing mortality to birds when constructing new communications towers. Switch off solid lights on existing towers and ensure that remaining lights have a synchronized, complete dark phase. Take steps to ensure that new towers avoid guy wires and minimize height, and avoid topographic locations where migrating birds are likely to be found in abundance. Retrofit existing towers to adhere to as many guidelines as possible.	2.1 Site/area management 5.3 Private sector standards and codes	All species But specifically noted in the threat assessment process for: Gray-cheeked Thrush Merlin Palm Warbler Swamp Sparrow
Collisions with power lines and accidental electrocution cause bird mortality.	4.2 Utility and service lines	Reduce mortality from collisions with utility lines/ transmission towers	2.7 Reduce incidental mortality from collisions.	In high-risk areas, retrofit power lines so that the risk of electrocution of raptors is minimized. In new developments, locate transmission lines underground. Use markers or paint to increase visibility of power lines in high-strike areas. Avoid siting lines over or near wetlands.	2.1 Site/area management	Waterfowl, herons, raptors But specifically noted in the threat assessment process for: Northern Hawk Owl Northern Shrike Peregrine Falcon (*anatum/tundrius*)

Climate Change

The effects of climate change are already measurable in many bird habitats and have resulted in range shifts and changes in the timing of migration and breeding in some species (National Audubon Society 2009, North American Bird Conservation Initiative, U.S. Committee 2009). Birds in all habitats will be affected by climate change. The most vulnerable are predicted to be those that are dependent on oceanic ecosystems and those found in coastal, island, grassland, arctic and alpine habitats (North American Bird Conservation Initiative, U.S. Committee 2010). Changing climate may also facilitate the spread of disease, the introduction of new predators and the invasion of non-native species that alter habitat structure and community composition (North American Bird Conservation Initiative, U.S. Committee 2009, Faaborg et al. 2010). See Tables 19 and 20 for a summary of impacts of climate change and conservation objectives.

A recent exercise used bioclimatic modelling to predict changes in bird species ranges based on anticipated climate change for different time periods and under different emissions scenarios (Lawler et al. unpublished; Lawler et al. 2009). Bioclimatic models use statistical associations between the current range of a species and a suite of climate variables to predict future ranges under new climate conditions. The study focused on priority bird species currently found within BCRs in Canada. The results suggest that bird species turnover in Canada will be highest in northern BCRs as species ranges continue to shift northward in the coming decades. In BCR 7 NL, the model predicts a gain of 63 species, a loss of 8 species for a total turnover (species gains + species losses) of 71%.

In the Atlantic region, winds, precipitation, storm activity and sea ice are all important in determining local climatic conditions and are influenced by global climate change. The interior and coastal areas of Labrador, including BCR 7 NL, are exposed primarily to continental influences, driven by the dominant southwesterly winds. Climate change is expected to create warmer and drier conditions in this region (Environment Canada 2000). A warming of temperatures could lead to tundra thawing or drying of several other habitats, which could cause range shifts and changes in prey abundance that will negatively affect bird populations. Changes in ecosystems and dominant species will occur, either through conversion (replacement of the dominant species by a subdominant species) or migration (long-distance movement of species that can rapidly adapt to new soil or topographic factors). The limit of the northern boreal forest may expand at the expense of tundra areas, although topographic and soil factors will limit the migration of treeline ecosystems (Vasseur and Catto 2008). Climate change is also predicted to lead to fewer, but more frequent and intense, extreme weather events such as hurricanes, storms and flooding in the region. At the same time, changes in winter snow conditions or periods without rain may impact run-off and overall water quality (NL Department of Environment and Conservation 2012). The largest watershed in Atlantic Canada is Churchill River (79 800 km^2), and as changes in temperature and precipitation influence evaporation and runoff, and in turn the amount of water stored in glaciers, lakes, wetlands and groundwater, this will affect the quantity and quality of water available for human use and ecosystems (Vasseur and Catto 2008).

In the Newfoundland and Labrador Shelves (MBU 10), some of the major impacts of climate change are expected to be enhanced coastal erosion, rising sea level in all areas except Lake Melville, and enhanced frost wedging in coastal locations (Catto, 2005). The rate of sea-level rise around Newfoundland and Labrador has increased over the last 300 years and is greatest on the Avalon Peninsula (3–5 mm/year) of the island of Newfoundland and decreases further northward (NL Department of Environment and Conservation 2012). The warming and expansion of oceans and the melting of glaciers has led to this rise in sea level, which in turn increases wave action along the coastline leading to increased erosion. The Labrador Current is fed by freshwater influx from Greenland, Arctic Canada and Labrador in addition to water from the European Arctic. An increase in the rate of glacial melting in Greenland would cause the Labrador Current to freshen and strengthen, bringing colder water and icebergs south along the northeastern Newfoundland-Labrador shelf (Vasseur and Catto 2008). In addition, sea ice and ice foot developments serve to protect these coastlines from wave erosion, thus a decline in sea ice due to global warming increases the vulnerability of these coasts. Arctic ice is also melting, causing increased freshwater export to the North Atlantic. This increase in freshwater will have an impact on ocean circulation and marine ecosystems reaching south to sub-Arctic regions of the northern Labrador Sea (NL Department of Environment and Conservation 2012).

In BCR 7 NL and MBU 10 NL, 13 and 10 priority bird species, respectively, are affected by climate change through changes in habitat structures, ranges, food webs, increased frequency and severity of storms, sea-level rise, and reduced productivity due to extreme weather (Tables 19 and 20).

To maintain healthy bird populations in the face of a changing climate, conservation must be carefully planned and must be implemented so as to buffer birds from the negative impacts of climate change wherever possible (Faaborg et al. 2010).

Table 19. Examples of the current and anticipated effects of climate change on bird populations in Canada and some affected bird species.

Note: The species shown here do not represent an exhaustive list; rather, they provide examples of species for which the effects of climate change have been suggested or documented.

Potential and Realized Effects of Climate Change	Examples of Species Affected in BCR 7 NL and MBU 10 NL
Mismatch between peak hatch and peak food abundance	Harlequin Duck (Eastern)
Habitat loss as a result of ecosystem changes (e.g., advances in treeline)	Black Scoter, Canada Goose (North Atlantic), Common Loon, Long-tailed Duck, Red-throated Loon, Rusty Blackbird, Semipalmated Sandpiper
Increase in severe weather events	Common Eider, Common Nighthawk, Olive-sided Flycatcher, Whimbrel
Introduction of new predators and competitors	Common Tern, Gray-cheeked Thrush, Leach's Storm Petrel, Merlin, Northern Gannet,
Range shifts to the north and from coastal to inland sites	American Golden-Plover, Gyrfalcon, Least Sandpiper
Changes in ocean temperature and currents impact marine productivity and food webs	Dovekie, Long-tailed Duck, Peregrine Falcon (*anatum/tundrius*)
Thawing of permafrost and increased evaporation will result in vegetation shifts and loss of wetlands in arctic habitat	Long-tailed Duck, Rusty Blackbird

Research and Population Monitoring Needs

Population Monitoring

An estimate of population trend for each species is necessary for the development of elements 1 and 3 (Species Assessment and Population Objectives). However, there are many species for which we are currently unable to estimate a population trend (PT) score. These species were typically assigned a population objective of "assess/maintain." The inability to estimate a PT score may be the result of a lack of monitoring data for the BCR as a whole or may be because certain species are not well captured by common monitoring techniques. To be able to effectively evaluate species believed to be of conservation concern, and to track those not yet of concern for future changes in status, we require more comprehensive monitoring that enables us to generate population trends for all species of birds in Canada. However, it is important to note that for some species, population trends are better understood at scales larger or smaller than the BCR unit, and lack of BCR-scale population trend data should not preclude acting to conserve these species.

A lack of information about population status was determined to be a significant conservation concern for 17 of the 36 priority bird species in BCR 7 NL and 26 of the 39 priority bird species in MBU 10 NL. Table 21 provides a list of recommendations to address knowledge gaps to allow for reliable estimates of population trends for these species and/or to investigate factors causing population declines.

A recent Environment Canada review (Avian Monitoring Review Steering Committee 2012) of avian monitoring programs in Canada made the following recommendations for each of the four main species groups:

Landbirds
- evaluate the ability of migration monitoring and checklist surveys to contribute to Environment Canada's monitoring needs; and
- evaluate the feasibility and cost-effectiveness of improving demographic monitoring to help understand causes of population change.

Shorebirds
- develop more reliable sampling methods for counting shorebirds in migration to address concerns about bias; and
- increase Latin American involvement in monitoring shorebirds on the wintering grounds, including Red Knot.

Waterbirds
- evaluate alternative strategies for filling gaps in coverage for both colonial waterbirds and marsh birds;
- consider both costs and potential reduction in risks; and
- carry out any necessary pilot work to evaluate options.

Waterfowl

- develop strategies to reduce expenditures on eastern waterfowl breeding surveys, while retaining acceptable precision in population estimates;
- review the information needs and expenditures for duck banding programs;
- realign resources for eider and scoter monitoring to a more efficient suite of surveys.

Environment Canada intends to hold further discussions with other government officials and key bird and habitat conservation players about bird population monitoring needs and priorities not only for BCR 7 NL and its associated marine units but also for all priority birds within Atlantic Region.

Table 21. Possible monitoring objectives for priority bird species for which there are currently insufficient data to reliably estimate population trend at the BCR 7 NL and MBU 10 NL scales.

Objective	Examples of Priority Species Affected
1. Increase and improve monitoring through appropriate surveys in order to determine population trends for priority species	**BCR 7 NL:** American Golden-Plover, Black Scoter, Common Loon, Common Tern, Gray-cheeked Thrush, Least Sandpiper, Long-tailed Duck, Red-throated Loon, Semipalmated Sandpiper, Short-eared Owl, Solitary Sandpiper, Surf Scoter, Whimbrel, White-winged Scoter, Wilson's Snipe **MBU 10 NL:** Barrow's Goldeneye (Eastern), Black Scoter, Common Eider, Common Goldeneye, Common Loon, Common Merganser, Common Murre, Common Tern, Cory's Shearwater, Dovekie, Great Skua, Greater Shearwater, King Eider, Leach's Storm-Petrel, Lesser Yellowlegs, Long-tailed Duck, Manx Shearwater, Purple Sandpiper, Razorbill, Red Knot (*rufa*), Red-necked Grebe, Red-throated Loon, Sanderling, Solitary Sandpiper, Sooty Shearwater, Surf Scoter, Thick-billed Murre, Whimbrel, White-winged Scoter

Research

The focus of this section is to outline the main areas where a lack of information hindered the ability to understand conservation needs and make conservation recommendations. Research objectives presented here are bigger picture questions, and not necessarily a schedule of studies, that are needed to determine the needs of individual species (Table 22). Undertaking research will allow us to improve future iterations of BCR strategies and to focus future implementation, and will also enable the development of new tools for conservation.

Table 22 provides a preliminary list of research needs for BCR 7 NL and MBU 10 NL and will be used as a starting point for further discussions with other government officials and key bird and habitat conservation players, as well as scientists, about research needs and priorities not only for BCR 7 NL and its associated marine unit but also for all priority birds within Atlantic Region.

Table 22: General research objectives in BCR 7 NL and MBU 10 NL.

Objective	Examples of Priority Species Affected
1. Map land cover changes that have occurred between the baseline time periods established in BCR plans and current day in order to assess habitat transitions that may be due to climate change and how these transitions affect priority species.	**BCR 7 NL:** American Golden-Plover, Least Sandpiper, Semipalmated Sandpiper, Whimbrel
2. Map land cover changes that have occurred between the baseline time periods established in BCR plans and current day in order to correlate land use changes with species population changes.	**BCR 7 NL:** Rough-legged Hawk
3. Determine cause of population decline in priority bird species which lack information on specific threats.	**BCR 7 NL:** Palm Warbler
4. Implement research programs to determine all possible threats to species and their effects on species populations	**MBU 10 NL:** Piping Plover (*melodus*)

Threats Outside Canada

Many bird species found in Canada spend a large portion of their life cycle outside the country (Fig. 36). These species face threats while they are outside Canada; in fact, threats to some migratory species may be most severe outside of the breeding season (Calvert et al. 2009). Of the 36 priority species in BCR 7 NL, 10 (28%) are migratory and spend part of their annual cycle—up to half the year or more—outside Canada.

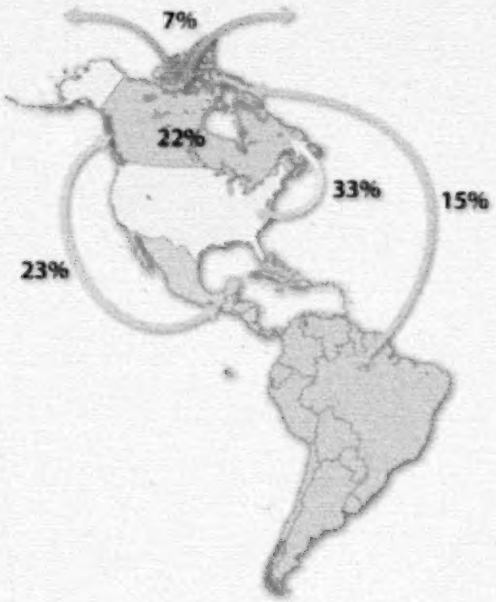

Figure 36. Percent of Canadian breeding birds that migrate to regions outside Canada for part of their life cycle (North American Bird Conservation Initiative 2012).

Similar to the assessment of threats facing priority species within Canada, we conducted a literature review to identify threats facing priority species while they are outside Canada. A lack of data was a pervasive issue for this exercise. For many species, little is known about threats they face during migration or while on their wintering grounds. Indeed, for some species, their wintering ranges and habitat use are only poorly known, if at all. There is also little information linking specific wintering areas to particular breeding populations, making it difficult to connect declines in breeding populations to potential problems on the wintering grounds. In addition, what data exist on wintering migrant species are heavily biased towards work done in the United States, and little research is available from Mexico, Central and South America. While many of the threats identified in the United States likely affect species throughout their range, unique issues outside the United States may have been missed. An absence of threats in a region may reflect that the necessary research has not yet been conducted (or may not be published in English). Because information on bird distributions during the non-breeding season is limited, we were unable to assess the scope and severity of threats to priority species while they are outside Canada.

Table 18 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
Collisions with vehicles cause bird mortality.	4.1 Roads and railroads	Reduce mortality from collisions with vehicles	2.7 Reduce incidental mortality from collisions.	Erect road signs or speed bumps to lower vehicle speeds where bird activity is frequent. Remove plants that attract birds from roadsides and medians. Landscape along roads using taller trees and bushes to cause birds to fly higher. Encourage the use of salt management plans to avoid unnecessary use of particulate salt (a bird attractant) on roads. Avoid locating roads in valuable bird habitat.	2.1 Site/area management 1.1 Site/area protection	All species But specifically noted in the threat assessment process for: Common Nighthawk Northern Shrike Peregrine Falcon (*anatum/tundrius*) Pine Grosbeak Wilson's Snipe
Population effects of collisions are unknown.	12.1 Information lacking	Improve understanding of population effects of mortality from collisions	7.4 Improve understanding of causes of population declines.	Assess the biological importance of bird kills from all sources of collisions.	8.1 Research	All species
Predation by Domestic Cats						
Mortality caused by cat predation.	8.1 Invasive non-native/ alien species	Reduce mortality from domestic and feral cats	2.4 Reduce incidental mortality.	Implement a "Cats Indoors!" Campaign following the guidelines of the American Bird Conservancy (www.abcbirds.org/abcprograms/ policy/cats/index.html). Work to reduce feral cat overpopulation through cat control regulations.	5.3 Private sector standards and codes 5.2 Policies and regulations	Ground nesting or ground foraging species; species attracted to feeders; species inhabiting suburban or urban areas But specifically noted in the threat assessment process for:

Table 18 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
						Common Nighthawk Merlin
Environmental Contaminants						
Mortality, sub-lethal effects, reductions in prey populations and habitat alteration caused by exposure to/use of pesticides.	9.3 Agricultural & forestry effluents	Reduce mortality and sub-lethal effects of pesticides on birds Reduce the effects of pesticides on prey species	2.1 Reduce mortality and/or sub-lethal effects from pesticide use. 5.1 Maintain natural food webs and prey sources.	Substantially reduce the use of pesticides/rodenticides/herbicides in Canada. Where elimination is not possible, they should be used as part of an integrated pest management system. Improve regulation of pesticides/rodenticides/herbicides in Canada to reduce bird mortality.	5.2 Policies and regulations 5.3 Private sector standards and codes	All species But specifically noted in the threat assessment process for: American Black Duck Canada Goose (North Atlantic) Common Nighthawk Green-winged Teal Harlequin Duck (Eastern) Lesser Yellowlegs Long-tailed Duck Merlin Northern Gannet Olive-sided Flycatcher Pine Grosbeak Ring-necked Duck Rough-legged Hawk Surf Scoter
Mortality from heavy metals and other contaminants.	9.2 Industrial & military effluents	Reduce mortality from heavy metals and other contaminants	2.2 Reduce mortality and/or sub-lethal effects from exposure to contaminants.	Work with industry and policy makers to reduce the quantity of heavy metals and other contaminants released into the environment.	5.3 Private sector standards and codes 5.2 Policies and regulations	All species But specifically noted in the threat assessment process for: Barrow's Goldeneye (Eastern) Black Scoter Common Eider Common Goldeneye Common Loon

Table 18 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
						Gyrfalcon Harlequin Duck (Eastern) Ivory Gull Leach's Storm-Petrel Long-tailed Duck Merlin Northern Gannet Peregrine Falcon Razorbill Red-necked Grebe Red-throated Loon Rusty Blackbird Thick-billed Murre Whimbrel White-winged Scoter
Mortality of waterbirds from oil pollution.	9. Pollution	Reduce mortality from oil pollution	2.3 Reduce mortality and/or sublethal effects of oil pollution. 5.1 Maintain natural food webs and prey sources.	Improve monitoring and enforcement capacity to reduce chronic oil pollution from illegal dumping of bilge waste and cleaning of oil tanks. Improve education/outreach to make sure that the oil industry and its regulators are aware of the potential impacts on birds and take measures to prevent exposure of birds to oil.	5.4 Compliance and enforcement 4.3 Awareness and communications	All species But specifically noted in the threat assessment process for: American Black Duck Atlantic Puffin Barrow's Goldeneye (Eastern) Black Scoter Black-legged Kittiwake Canada Goose (North Atlantic) Common Eider Common Goldeneye Common Loon Common Merganser Common Murre Common Tern

Table 18 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
						Cory's Shearwater Dovekie Great Shearwater Great Skua Harlequin Duck (Eastern) Ivory Gull King Eider Leach's Storm-Petrel Lesser Yellowlegs Long-tailed Duck Manx Shearwater Northern Gannet Purple Sandpiper Razorbill Red-necked Grebe Red-throated Loon Sanderling Sooty Shearwater Surf Scoter Thick-billed Murre Whimbrel White-rumped Sandpiper White-winged Scoter
Population effects of pollution are unknown.	12.1 information lacking	Improve understanding of population effects of pollution	7.4 Improve understanding of causes of population declines.	Evaluate the affects of PBDEs and other chemicals on vital rates in birds.	8.1 Research	All species
				Evaluate the extent to which pesticides are reducing prey availability for aerial insectivores.		
				Improve the ability to monitor and understand the effects of contaminant concentrations in	8.2 Monitoring	

Table 18 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
				birds. Continue to acquire information on oiling of waterbirds through programs like Birds Oiled at Sea.		

Table 20. Proposed conservation objectives and actions to address climate change.

Threats Addressed	Threat Subcategory	Objective	Objective Category	Recommended Actions	Action Category	Planning Unit: Priority Bird Species Affected (Rank of Threat)
Climate change impacts habitat and negatively affects survival and productivity of birds	11.1 Habitat shifting and alteration	Reduce greenhouse gas emissions	6.1 Support efforts to reduce greenhouse gas emissions	Support efforts to reduce greenhouse gas emissions.	5.2 Policies and regulations	BCR 7 NL: American Golden-Plover (H) Common Loon (M) Gyrfalcon (L) Least Sandpiper (H) Long-tailed Duck (H) Canada Goose (North Atlantic) (M) Peregrine Falcon (*anatum/tundrius*) (M) Red-throated Loon (M) Rusty Blackbird (L) Semipalmated Sandpiper (H) MBU 10 NL: Dovekie (M) Lesser Yellowlegs (H) Piping Plover (*melodus*) (H) Sanderling (H) White-rumped Sandpiper (H)
		Mitigate the effects of climate change on bird habitat	6.2 Manage for habitat resilience as climate changes	Manage for habitat resilience to allow ecosystems to adapt despite disturbances and changing conditions. Minimize anthropogenic stressors (such as development or pollution) to help maintain resilience.	1.1 Site/area protection	
				Manage buffer areas and the matrix between protected areas to enhance movement of species across the landscape.	2.1 Site/area management	
				Manage ecosystems to maximize carbon storage and sequestration while simultaneously enhancing bird habitat.		
				Incorporate predicted shifts in habitat into landscape level plans (e.g., when establishing protected areas ensure the maintenance of north-south corridors to facilitate northward range shifts of bird species).	5.2 Policies and regulations	

Table 20 continued

Threats Addressed	Threat Subcategory	Objective	Objective Category	Recommended Actions	Action Category	Planning Unit: Priority Bird Species Affected (Rank of Threat)
Population-level effects of climate change are unknown	12.1 Information lacking	Improve understanding of climate change on birds and their habitats	7.5 Improve understanding of potential effects of climate change	Evaluate which species are most vulnerable to climate change. Investigate the cumulative effects of climate change. Investigate behavioural responses to climate change (such as range shifts, changes in demographic rates, and changes in timing of breeding and migration) through long-term studies.	8.1 Research	BCR 7 NL: American Golden-Plover (H) Least Sandpiper (H) Semipalmated Sandpiper (H) Whimbrel (H) MBU 10 NL: Red Knot (*rufa*) (H)
				Continue to monitor bird populations so changes in numbers and distributions can be identified. Undertake monitoring to evaluate the effectiveness of mitigation activities.	8.2 Monitoring	

Despite this, some information is available to inform conservation work outside Canada (Fig. 37, 38). Priority birds from BCR 7 NL face mortality from exposure to contaminants such as PCBs, heavy metals and oil (9.2 Industrial & military effluents), primarily during migration, and from illegal or unregulated hunting, poisoning from lead shot or fishing tackle, and unintended bycatch (5.1 Hunting and collecting terrestrial animals and 5.4 Fishing and harvesting aquatic resources) on both their migration and wintering grounds.

In addition to mortality, priority species from BCR 7 NL face the loss or degradation of key migration and wintering habitats. The primary sources of habitat loss and degradation are conversion of grasslands and wetlands to agriculture (2.1 Annual & perennial non-timber crops and 2.3 Livestock farming and ranching) and urban development (1.1 Housing & urban areas). The threat of loss and degradation of stopover or overwintering habitat is greater for species that have relatively small and concentrated wintering ranges.

Collisions with human-made structures such as fences, vehicles and power lines are also threats during migration (2.3 Livestock farming and ranching, 4.1 Roads and railroads and 4.2 Utility & service lines). Decreases in water quality and loss of insect prey are also documented threats to priority birds from BCR 7 NL (9.3 Agriculture and forestry effluents).

Certain threats more particularly affect marine priority species from MBU 10 NL (Fig. 38) during migration and at wintering and stopover sites. The most important threat to these species is mortality from exposure to contaminants including PCBs, heavy metals and oil, on the migration routes and on the wintering grounds (9.2 Industrial and military effluents). Though this is also a threat to BCR 7 NL species, it is by far the most significant threat when considering marine species from MBU 10 NL. Additional mortality stems from bycatch in commercial fisheries, illegal or unregulated hunting, and contamination from lead shot and fishing tackle (5.1 Hunting and collecting terrestrial animals and 5.4 Fishing and harvesting aquatic resources). These species are also affected by loss of habitat to agriculture and urban development (2.1 Annual & perennial non-timber crops and 1.1 Housing & urban areas).

Despite the paucity of data regarding migration and wintering migrant birds, actions must be taken to support our migratory species. We need to support conservation initiatives outside Canada if we are to reach our goals and ensure the future of our migratory birds.

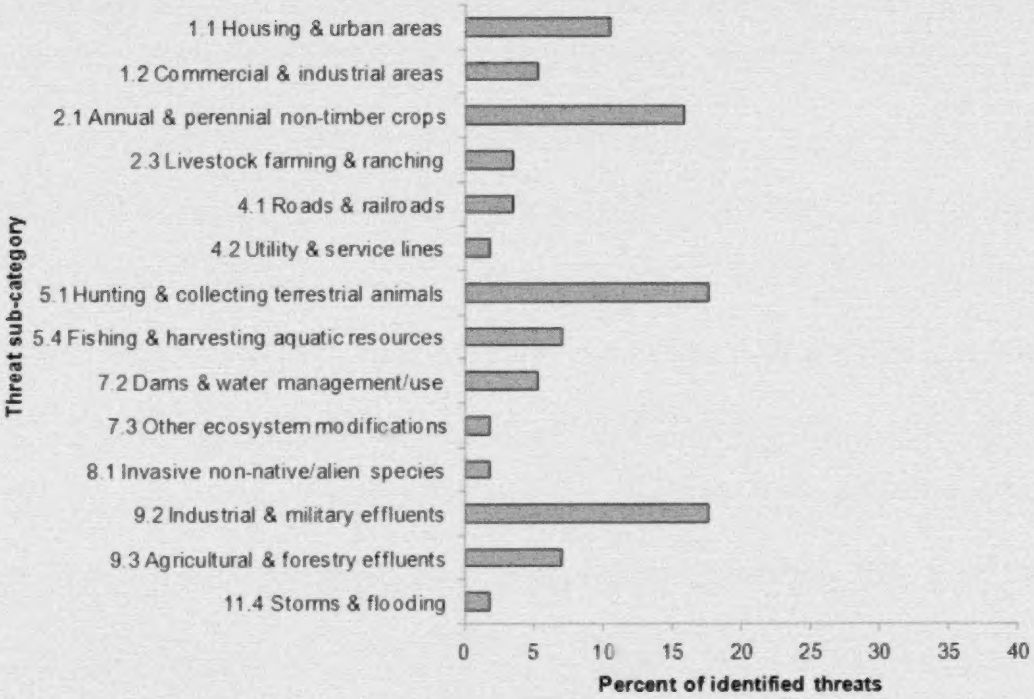

Figure 37. Percent of identified threats to priority species (by threat sub-category) in BCR 7 NL when they are outside Canada.

Note: Magnitudes could not be assigned for threats outside Canada due to lack of information on scope and severity.

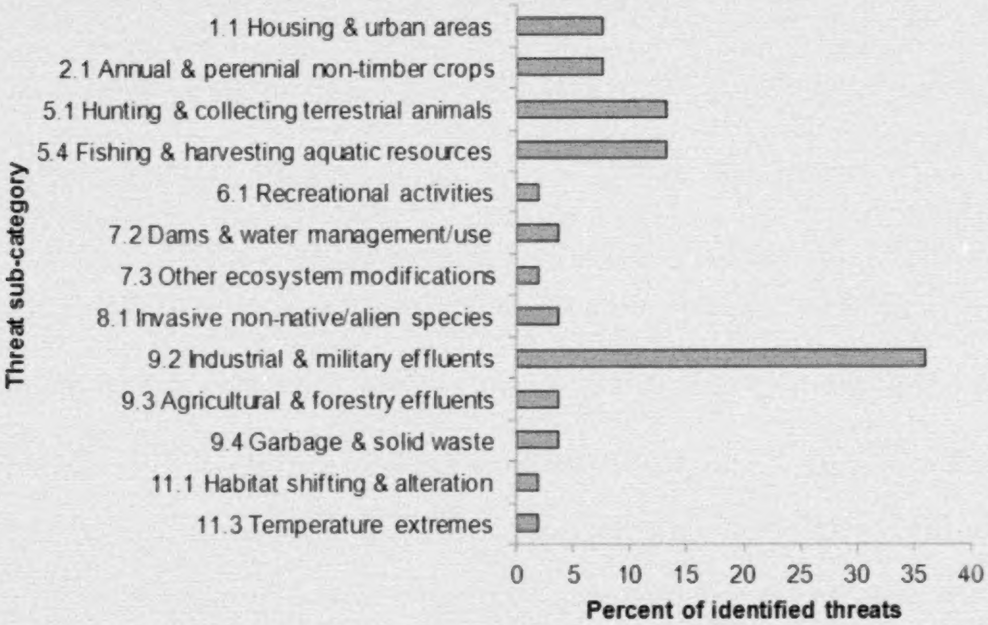

Figure 38. Percent of identified threats to priority species (by threat sub-category) in MBU 10 NL when they are outside Canada.

Note: Magnitudes could not be assigned for threats outside Canada due to lack of information on scope and severity.

Next Steps

The primary aims of BCR strategies are to present Environment Canada's priorities with respect to migratory bird conservation, and to provide a comprehensive overview of the conservation needs of bird populations to practitioners who may then undertake activities that promote bird conservation in Canada and internationally. Users from all levels of government, Aboriginal communities, the private sector, academia, NGOs and citizens will benefit from the information. BCR strategies can be used in many different ways depending on the needs of the user, who may focus on one or more of the elements of the strategy to guide their conservation projects.

BCR strategies will be updated periodically. Errors, omissions and additional sources of information may be provided to Environment Canada at any time for inclusion in subsequent versions.

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Appendix 1

List of All Bird Species in BCR 7 NL and MBU 10 NL

Table A-1. Complete list of species in BCR 7 NL and MBU 10 NL, and when they are in the BCR (breeding, migrant, winter, seasonal) and their priority status.

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Empidonax alnorum	Alder Flycatcher	Moucherolle des aulnes	Landbirds	BCR 7 NL				
Corvus brachyrhynchos	American Crow	Corneille d'Amérique	Landbirds	BCR 7 NL				
Anthus rubescens	American Pipit	Pipit d'Amérique	Landbirds	BCR 7 NL	BCR 7 NL			
Setophaga ruticilla	American Redstart	Paruline flamboyante	Landbirds	BCR 7 NL				
Turdus migratorius	American Robin	Merle d'Amérique	Landbirds	BCR 7 NL				
Picoides dorsalis	American Three-toed Woodpecker	Pic à dos rayé	Landbirds	BCR 7 NL		BCR 7 NL		BCR 7 NL
Spizella arborea	American Tree Sparrow	Bruant hudsonien	Landbirds	BCR 7 NL	BCR 7 NL			
Haliaeetus leucocephalus	Bald Eagle	Pygargue à tête blanche	Landbirds	BCR 7 NL MBU 10 NL		MBU 10 NL	MBU 10 NL	
Riparia riparia	Bank Swallow	Hirondelle de rivage	Landbirds	BCR 7 NL				
Megaceryle alcyon	Belted Kingfisher	Martin-pêcheur d'Amérique	Landbirds	BCR 7 NL			MBU 10 NL	
Picoides arcticus	Black-backed Woodpecker	Pic à dos noir	Landbirds	BCR 7 NL		BCR 7 NL		BCR 7 NL
Setophaga striata	Blackpoll Warbler	Paruline rayée	Landbirds	BCR 7 NL				
Setophaga virens	Black-throated Green Warbler	Paruline à gorge noire	Landbirds	BCR 7 NL				
Poecile hudsonicus	Boreal Chickadee	Mésange à tête brune	Landbirds	BCR 7 NL		BCR 7 NL		BCR 7 NL
Aegolius funereus	Boreal Owl	Nyctale de Tengmalm	Landbirds	BCR 7 NL		BCR 7 NL		
Setophaga tigrina	Cape May Warbler	Paruline tigrée	Landbirds	BCR 7 NL				
Chordeiles minor	Common Nighthawk	Engoulevent d'Amérique	Landbirds	BCR 7 NL				BCR 7 NL

Table A-1 continued

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Corvus corax	Common Raven	Grand corbeau	Landbirds	BCR 7 NL		BCR 7 NL		
Acanthis flammea	Common Redpoll	Sizerin flammé	Landbirds	BCR 7 NL		BCR 7 NL		
Geothlypis trichas	Common Yellowthroat	Paruline masquée	Landbirds	BCR 7 NL				
Junco hyemalis	Dark-eyed Junco	Junco ardoisé	Landbirds	BCR 7 NL				
Picoides pubescens	Downy Woodpecker	Pic mineur	Landbirds	BCR 7 NL		BCR 7 NL		
Passerella iliaca	Fox Sparrow	Bruant fauve	Landbirds	BCR 7 NL				
Aquila chrysaetos	Golden Eagle	Aigle royal	Landbirds	BCR 7 NL				
Perisoreus canadensis	Gray Jay	Mésangeai du Canada	Landbirds	BCR 7 NL		BCR 7 NL		BCR 7 NL
Catharus minimus	Gray-cheeked Thrush	Grive à joues grises	Landbirds	BCR 7 NL				BCR 7 NL
Bubo virginianus	Great Horned Owl	Grand-duc d'Amérique	Landbirds	BCR 7 NL		BCR 7 NL		
Falco rusticolus	Gyrfalcon	Faucon gerfaut	Landbirds	BCR 7 NL		BCR 7 NL		BCR 7 NL
Picoides villosus	Hairy Woodpecker	Pic chevelu	Landbirds	BCR 7 NL		BCR 7 NL		
Catharus guttatus	Hermit Thrush	Grive solitaire	Landbirds	BCR 7 NL				
Acanthis hornemanni	Hoary Redpoll	Sizerin blanchâtre	Landbirds			BCR 7 NL		
Eremophila alpestris	Horned Lark	Alouette hausse-col	Landbirds	BCR 7 NL				
Calcarius lapponicus	Lapland Longspur	Plectrophane lapon	Landbirds	BCR 7 NL	BCR 7 NL			
Melospiza lincolnii	Lincoln's Sparrow	Bruant de Lincoln	Landbirds	BCR 7 NL				
Falco columbarius	Merlin	Faucon émerillon	Landbirds	BCR 7 NL				BCR 7 NL
Colaptes auratus	Northern Flicker	Pic flamboyant	Landbirds	BCR 7 NL				
Accipiter gentilis	Northern Goshawk	Autour des palombes	Landbirds	BCR 7 NL		BCR 7 NL		
Surnia ulula	Northern Hawk Owl	Chouette épervière	Landbirds	BCR 7 NL		BCR 7 NL		BCR 7 NL
Lanius excubitor	Northern Shrike	Pie-grièche grise	Landbirds	BCR 7 NL	BCR 7 NL			BCR 7 NL
Parkesia noveboracensis	Northern Waterthrush	Paruline des ruisseaux	Landbirds	BCR 7 NL				
Oenanthe oenanthe	Northern Wheatear	Traquet motteux	Landbirds	BCR 7 NL				
Contopus cooperi	Olive-sided Flycatcher	Moucherolle à côtés olive	Landbirds	BCR 7 NL				BCR 7 NL
Oreothlypis celata	Orange-crowned	Paruline verdâtre	Landbirds	BCR 7 NL				

Table A-1 continued

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
	Warbler							
Pandion haliaetus	Osprey	Balbuzard pêcheur	Landbirds	BCR 7 NL			MBU 10 NL	
Setophaga palmarum	Palm Warbler	Paruline à couronne rousse	Landbirds	BCR 7 NL				BCR 7 NL
Falco peregrinus	Peregrine Falcon (*anatum/tundrius*)	Faucon pèlerin (*anatum/tundrius*)	Landbirds	BCR 7 NL				BCR 7 NL
Pinicola enucleator	Pine Grosbeak	Durbec des sapins	Landbirds	BCR 7 NL		BCR 7 NL		BCR 7 NL
Spinus pinus	Pine Siskin	Tarin des pins	Landbirds	BCR 7 NL				
Haemorhous purpureus	Purple Finch	Roselin pourpré	Landbirds	BCR 7 NL				
Sitta canadensis	Red-breasted Nuthatch	Sittelle à poitrine rousse	Landbirds	BCR 7 NL		BCR 7 NL		
Lagopus muta	Rock Ptarmigan	Lagopède alpin	Landbirds	BCR 7 NL		BCR 7 NL		
Buteo lagopus	Rough-legged Hawk	Buse pattue	Landbirds	BCR 7 NL				BCR 7 NL
Regulus calendula	Ruby-crowned Kinglet	Roitelet à couronne rubis	Landbirds	BCR 7 NL				
Bonasa umbellus	Ruffed Grouse	Gélinotte huppée	Landbirds	BCR 7 NL		BCR 7 NL		
Euphagus carolinus	Rusty Blackbird	Quiscale rouilleux	Landbirds	BCR 7 NL				BCR 7 NL
Passerculus sandwichensis	Savannah Sparrow	Bruant des prés	Landbirds	BCR 7 NL				
Accipiter striatus	Sharp-shinned Hawk	Épervier brun	Landbirds	BCR 7 NL				
Asio flammeus	Short-eared Owl	Hibou des marais	Landbirds	BCR 7 NL				BCR 7 NL
Plectrophenax nivalis	Snow Bunting	Plectrophane des neiges	Landbirds	BCR 7 NL	BCR 7 NL			
Bubo scandiacus	Snowy Owl	Harfang des neiges	Landbirds	BCR 7 NL		BCR 7 NL MBU 10 NL		MBU 10 NL
Falcipennis canadensis	Spruce Grouse	Tétras du Canada	Landbirds	BCR 7 NL		BCR 7 NL		
Catharus ustulatus	Swainson's Thrush	Grive à dos olive	Landbirds	BCR 7 NL				
Melospiza georgiana	Swamp Sparrow	Bruant des marais	Landbirds	BCR 7 NL				BCR 7 NL
Oreothlypis peregrina	Tennessee Warbler	Paruline obscure	Landbirds	BCR 7 NL				
Tachycineta bicolor	Tree Swallow	Hirondelle bicolore	Landbirds	BCR 7 NL				

Table A-1 continued

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Zonotrichia leucophrys	White-crowned Sparrow	Bruant à couronne blanche	Landbirds	BCR 7 NL				
Zonotrichia albicollis	White-throated Sparrow	Bruant à gorge blanche	Landbirds	BCR 7 NL				
Loxia leucoptera	White-winged Crossbill	Bec-croisé bifascié	Landbirds	BCR 7 NL		BCR 7 NL		
Lagopus lagopus	Willow Ptarmigan	Lagopède des saules	Landbirds	BCR 7 NL		BCR 7 NL		
Cardellina pusilla	Wilson's Warbler	Paruline à calotte noire	Landbirds	BCR 7 NL				
Setophaga petechia	Yellow Warbler	Paruline jaune	Landbirds	BCR 7 NL				
Empidonax flaviventris	Yellow-bellied Flycatcher	Moucherolle à ventre jaune	Landbirds	BCR 7 NL				
Setophaga coronata	Yellow-rumped Warbler	Paruline à croupion jaune	Landbirds	BCR 7 NL				
Pluvialis dominica	American Golden-Plover	Pluvier bronzé	Shorebirds		BCR 7 NL	MBU 10 NL		BCR 7 NL
Calidris bairdii	Baird's Sandpiper	Bécasseau de Baird	Shorebirds			MBU 10 NL		
Pluvialis squatarola	Black-bellied Plover	Pluvier argenté	Shorebirds		BCR 7 NL MBU 10 NL			
Calidris alpina	Dunlin	Bécasseau variable	Shorebirds		BCR 7 NL MBU 10 NL			
Tringa melanoleuca	Greater Yellowlegs	Grand chevalier	Shorebirds	BCR 7 NL	BCR 7 NL MBU 10 NL			
Limosa haemastica	Hudsonian Godwit	Barge hudsonienne	Shorebirds		MBU 10 NL			
Charadrius vociferus	Killdeer	Pluvier kildir	Shorebirds		BCR 7 NL MBU 10 NL			
Calidris minutilla	Least Sandpiper	Bécasseau minuscule	Shorebirds	BCR 7 NL	BCR 7 NL MBU 10 NL			BCR 7 NL
Tringa flavipes	Lesser Yellowlegs	Petit chevalier	Shorebirds		BCR 7 NL MBU 10 NL			
Calidris melanotos	Pectoral Sandpiper	Bécasseau à poitrine cendrée	Shorebirds		BCR 7 NL MBU 10 NL			
Charadrius melodus melodus	Piping Plover (*melodus*)	Pluvier siffleur (*melodus*)	Shorebirds	MBU 10 NL	MBU 10 NL			MBU 10 NL

Table A-1 continued

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Calidris maritima	Purple Sandpiper	Bécasseau violet	Shorebirds		BCR 7 NL MBU 10 NL	MBU 10 NL		MBU 10 NL
Calidris canutus rufa	Red Knot (*rufa*)	Bécasseau maubèche (*rufa*)	Shorebirds		MBU 10 NL			MBU 10 NL
Phalaropus fulicarius	Red Phalarope	Phalarope à bec large	Shorebirds		MBU 10 NL			
Phalaropus lobatus	Red-necked Phalarope	Phalarope à bec étroit	Shorebirds	BCR 7 NL	BCR 7 NL MBU 10 NL			
Arenaria interpres	Ruddy Turnstone	Tournepierre à collier	Shorebirds		BCR 7 NL MBU 10 NL	MBU 10 NL		
Calidris alba	Sanderling	Bécasseau sanderling	Shorebirds		BCR 7 NL MBU 10 NL	MBU 10 NL		MBU 10 NL
Charadrius semipalmatus	Semipalmated Plover	Pluvier semipalmé	Shorebirds	BCR 7 NL	BCR 7 NL MBU 10 NL			
Calidris pusilla	Semipalmated Sandpiper	Bécasseau semipalmé	Shorebirds	BCR 7 NL	BCR 7 NL MBU 10 NL			BCR 7 NL
Limnodromus griseus	Short-billed Dowitcher	Bécassin roux	Shorebirds	BCR 7 NL	MBU 10 NL			
Tringa solitaria	Solitary Sandpiper	Chevalier solitaire	Shorebirds	BCR 7 NL	MBU 10 NL			BCR 7 NL MBU 10 NL
Actitis macularius	Spotted Sandpiper	Chevalier grivelé	Shorebirds	BCR 7 NL	BCR 7 NL MBU 10 NL			
Numenius phaeopus	Whimbrel	Courlis corlieu	Shorebirds		BCR 7 NL MBU 10 NL			BCR 7 NL MBU 10 NL
Calidris fuscicollis	White-rumped Sandpiper	Bécasseau à croupion blanc	Shorebirds		BCR 7 NL MBU 10 NL			
Tringa semipalmata	Willet	Chevalier semipalmé	Shorebirds		MBU 10 NL			
Gallinago delicata	Wilson's Snipe	Bécassine de Wilson	Shorebirds	BCR 7 NL	BCR 7 NL MBU 10 NL			BCR 7 NL
Botaurus lentiginosus	American Bittern	Butor d'Amérique	Waterbirds	BCR 7 NL MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Fulica americana	American Coot	Foulque d'Amérique	Waterbirds			MBU 10 NL	MBU 10 NL	
Sterna paradisaea	Arctic Tern	Sterne arctique	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		

Table A-1 continued

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Fratercula arctica	Atlantic Puffin	Macareux moine	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Cepphus grylle	Black Guillemot	Guillemot à miroir	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		
Chroicocephalus ridibundus	Black-headed Gull	Mouette rieuse	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		
Rissa tridactyla	Black-legged Kittiwake	Mouette tridactyle	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Chroicocephalus philadelphia	Bonaparte's Gull	Mouette de Bonaparte	Waterbirds		MBU 10 NL	MBU 10 NL		
Hydroprogne caspia	Caspian Tern	Sterne caspienne	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		
Gavia immer	Common Loon	Plongeon huard	Waterbirds	BCR 7 NL	MBU 10 NL	MBU 10 NL		BCR 7 NL MBU 10 NL
Uria aalge	Common Murre	Guillemot marmette	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Sterna hirundo	Common Tern	Sterne pierregarin	Waterbirds	BCR 7 NL MBU 10 NL	MBU 10 NL			BCR 7 NL MBU 10 NL
Calonectris diomedea	Cory's Shearwater	Puffin cendré	Waterbirds		MBU 10 NL			MBU 10 NL
Phalacrocorax auritus	Double-crested Cormorant	Cormoran à aigrettes	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		
Alle alle	Dovekie	Mergule nain	Waterbirds		MBU 10 NL	MBU 10 NL		MBU 10 NL
Larus hyperboreus	Glaucous Gull	Goéland bourgmestre	Waterbirds	MBU 10 NL	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL		
Larus marinus	Great Black-backed Gull	Goéland marin	Waterbirds	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL		
Ardea herodias	Great Blue Heron	Grand héron	Waterbirds	MBU 10 NL	MBU 10 NL			
Phalacrocorax carbo	Great Cormorant	Grand cormoran	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		
Ardea alba	Great Egret	Grande aigrette	Waterbirds		MBU 10 NL			
Puffinus gravis	Great Shearwater	Puffin majeur	Waterbirds		MBU 10 NL		MBU 10 NL	MBU 10 NL
Stercorarius skua	Great Skua	Grand labbe	Waterbirds		MBU 10 NL	MBU 10 NL		MBU 10 NL
Larus argentatus	Herring Gull	Goéland argenté	Waterbirds	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL		

Appendix 2

General Methodology for Compiling the Six Standard Elements

Each strategy includes six required elements to conform to the national standard. An extensive manual (Kennedy et al. 2012) provides methods and other guidance for completing each element. The six elements provide an objective means of moving towards multi-species conservation efforts that are targeted to species and issues of highest priority. The six elements are:

1) identifying priority species – to focus conservation attention on species of conservation concern and those most representative of the region
2) attributing priority species to habitat classes – a tool for identifying habitats of conservation interest and a means of organizing and presenting information
3) setting population objectives for priority species – an assessment of current population status compared to the desired status, and a means of measuring conservation success
4) assessing and ranking threats – identifies the relative importance of issues affecting populations of priority species within the planning area as well as outside Canada (i.e., throughout their life cycle)
5) setting conservation objectives – outlines the overall conservation goals in response to identified threats and information needs; also a means of measuring accomplishments
6) proposing recommended actions – strategies to begin on-the-ground conservation to help achieve conservation objectives.

The first four elements apply to individual priority species and together comprise an assessment of the status of priority species and the threats they face. The last two elements integrate information across species to create a vision for conservation implementation both within Canada and in countries that host priority species during migration and the non-breeding season.

Element 1: Priority Species Assessment

The Bird Conservation strategies identify "priority species" from all regularly occurring bird species in each subregion. The priority species approach allows management attention and limited resources to focus on those species with particular conservation importance, ecological significance and/or management need. The species assessment processes used are derived from standard assessment protocols developed by the four major bird conservation initiatives[6].

The species assessment process applies quantitative rule sets to biological data for factors such as:

- population size,
- breeding and non-breeding distribution,
- population trend,

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[6] Partners in Flight (landbirds), Wings Over Water (waterbirds), Canadian Shorebird Conservation Plan (shorebirds), North American Waterfowl Management Plan (waterfowl).

Table A-1 continued

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Larus glaucoides	Iceland Gull	Goéland arctique	Waterbirds		BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL		
Pagophila eburnea	Ivory Gull	Mouette blanche	Waterbirds			MBU 10 NL		MBU 10 NL
Leucophaeus atricilla	Laughing Gull	Mouette atricille	Waterbirds		MBU 10 NL			
Oceanodroma leucorhoa	Leach's Storm-Petrel	Océanite cul-blanc	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Larus fuscus	Lesser Black-backed Gull	Goéland brun	Waterbirds		BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL		
Stercorarius longicaudus	Long-tailed Jaeger	Labbe à longue queue	Waterbirds		MBU 10 NL	MBU 10 NL		
Puffinus puffinus	Manx Shearwater	Puffin des Anglais	Waterbirds	MBU 10 NL	MBU 10 NL		MBU 10 NL	MBU 10 NL
Fulmarus glacialis	Northern Fulmar	Fulmar boréal	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		
Morus bassanus	Northern Gannet	Fou de Bassan	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Stercorarius parasiticus	Parasitic Jaeger	Labbe parasite	Waterbirds		MBU 10 NL	MBU 10 NL		
Stercorarius pomarinus	Pomarine Jaeger	Labbe pomarin	Waterbirds		MBU 10 NL	MBU 10 NL		
Alca torda	Razorbill	Petit pingouin	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Podiceps grisegena	Red-necked Grebe	Grèbe jougris	Waterbirds		MBU 10 NL	MBU 10 NL		MBU 10 NL
Gavia stellata	Red-throated Loon	Plongeon catmarin	Waterbirds	BCR 7 NL	MBU 10 NL	MBU 10 NL		BCR 7 NL MBU 10 NL
Larus delawarensis	Ring-billed Gull	Goéland à bec cerclé	Waterbirds	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL	MBU 10 NL		
Xema sabini	Sabine's Gull	Mouette de Sabine	Waterbirds		MBU 10 NL			
Puffinus griseus	Sooty Shearwater	Puffin fuligineux	Waterbirds		MBU 10 NL		MBU 10 NL	MBU 10 NL
Porzana carolina	Sora	Marouette de Caroline	Waterbirds	BCR 7 NL MBU 10 NL	MBU 10 NL			
Stercorarius maccormicki	South Polar Skua	Labbe de McCormick	Waterbirds		MBU 10 NL		MBU 10 NL	
Uria lomvia	Thick-billed Murre	Guillemot de Brünnich	Waterbirds	MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Oceanites oceanicus	Wilson's Storm-Petrel	Océanite de Wilson	Waterbirds		MBU 10 NL		MBU 10 NL	

Table A-1 continued

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Anas rubripes	American Black Duck	Canard noir	Waterfowl	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL			BCR 7 NL
Anas americana	American Wigeon	Canard d'Amérique	Waterfowl	BCR 7 NL	MBU 10 NL			
Bucephala islandica	Barrow's Goldeneye (Eastern)	Garrot d'Islande (de l'Est)	Waterfowl		MBU 10 NL	MBU 10 NL		MBU 10 NL
Melanitta americana	Black Scoter	Macreuse à bec jaune	Waterfowl	BCR 7 NL	MBU 10 NL	MBU 10 NL		BCR 7 NL MBU 10 NL
Branta bernicla	Brant	Bernache cravant	Waterfowl		MBU 10 NL			
Bucephala albeola	Bufflehead	Petit garrot	Waterfowl		MBU 10 NL	MBU 10 NL		
Branta canadensis	Canada Goose	Bernache du Canada	Waterfowl	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL			
Branta canadensis	Canada Goose (North Atlantic)	Bernache du Canada (Atlantique Nord)	Waterfowl	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL			BCR 7 NL MBU 10 NL
Branta canadensis	Canada Goose (Temperate-breeding in Eastern Canada)	Bernache du Canada (qui se reproduit dans des régions tempérées de l'est du Canada)	Waterfowl	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL			
Somateria mollissima	Common Eider	Eider à duvet	Waterfowl	MBU 10 NL	MBU 10 NL	MBU 10 NL		MBU 10 NL
Bucephala clangula	Common Goldeneye	Garrot à oeil d'or	Waterfowl	BCR 7 NL	BCR 7 NL MBU 10 NL	MBU 10 NL		BCR 7 NL MBU 10 NL
Mergus merganser	Common Merganser	Grand harle	Waterfowl	BCR 7 NL	BCR 7 NL MBU 10 NL	MBU 10 NL		MBU 10 NL
Aythya marila	Greater Scaup	Fuligule milouinan	Waterfowl	BCR 7 NL		MBU 10 NL		
Anas crecca	Green-winged Teal	Sarcelle d'hiver	Waterfowl	BCR 7 NL	MBU 10 NL			BCR 7 NL
Histrionicus histrionicus	Harlequin Duck (Eastern)	Arlequin plongeur (de l'Est)	Waterfowl	BCR 7 NL	MBU 10 NL	MBU 10 NL		BCR 7 NL MBU 10 NL
Lophodytes cucullatus	Hooded Merganser	Harle couronné	Waterfowl	BCR 7 NL	BCR 7 NL			

Table A-1 continued

Latin Name	Common Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Somateria spectabilis	King Eider	Eider à tête grise	Waterfowl		MBU 10 NL	MBU 10 NL		MBU 10 NL
Aythya affinis	Lesser Scaup	Petit fuligule	Waterfowl	BCR 7 NL	MBU 10 NL	MBU 10 NL		
Clangula hyemalis	Long-tailed Duck	Harelde kakawi	Waterfowl	BCR 7 NL MBU 10 NL	BCR 7 NL MBU 10 NL	MBU 10 NL		BCR 7 NL MBU 10 NL
Anas platyrhynchos	Mallard	Canard colvert	Waterfowl	BCR 7 NL	BCR 7 NL MBU 10 NL			
Anas acuta	Northern Pintail	Canard pilet	Waterfowl	BCR 7 NL	BCR 7 NL MBU 10 NL			
Anas clypeata	Northern Shoveler	Canard souchet	Waterfowl		BCR 7 NL			
Mergus serrator	Red-breasted Merganser	Harle huppé	Waterfowl	BCR 7 NL MBU 10 NL	MBU 10 NL	MBU 10 NL		
Aythya collaris	Ring-necked Duck	Fuligule à collier	Waterfowl	BCR 7 NL	MBU 10 NL			BCR 7 NL
Melanitta perspicillata	Surf Scoter	Macreuse à front blanc	Waterfowl	BCR 7 NL	MBU 10 NL			BCR 7 NL MBU 10 NL
Melanitta fusca	White-winged Scoter	Macreuse brune	Waterfowl		MBU 10 NL	MBU 10 NL		MBU 10 NL

List of Priority Bird Species Associated with Each Habitat Class in BCR 7 NL and MBU 10 NL

Table A-2: List of priority bird species associated with each habitat class in BCR 7 NL and MBU 10 NL. Some species are priorities in both planning units.

BCR 7 NL	MBU 10 NL	Priority Species	Bird Group	BCR 7 NL									MBU 10 NL	
				Coniferous	Shrub/early successional	Lichens/mosses	Herbaceous	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)
Total number of priority species in each habitat class:				14	12	2	2	2	19	13	14	15	32	28
Y		American Three-toed Woodpecker	Landbirds	Y										
Y		Black-backed Woodpecker	Landbirds	Y										
Y		Boreal Chickadee	Landbirds	Y										
Y		Common Nighthawk	Landbirds	Y				Y	Y	Y				
Y		Gray Jay	Landbirds	Y					Y					
Y		Gray-cheeked Thrush	Landbirds	Y										
Y		Gyrfalcon	Landbirds		Y					Y		Y		
Y		Merlin	Landbirds	Y	Y					Y		Y		
Y		Northern Hawk Owl	Landbirds	Y					Y					
Y		Northern Shrike	Landbirds	Y	Y									
Y		Olive-sided Flycatcher	Landbirds	Y					Y					
Y		Palm Warbler	Landbirds	Y	Y				Y					

Table A-2 continued

BCR 7 NL	MBU 10 NL	Priority Species	Bird Group	BCR 7 NL									MBU 10 NL	
				Coniferous	Shrub/early successional	Lichens/mosses	Herbaceous	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)
Y		Peregrine Falcon (*anatum/tundrius*)	Landbirds		Y	Y		Y		Y		Y		
Y		Pine Grosbeak	Landbirds	Y										
Y		Rough-legged Hawk	Landbirds	Y	Y					Y				
Y		Rusty Blackbird	Landbirds	Y					Y	Y				
Y		Short-eared Owl	Landbirds		Y		Y		Y			Y		
	Y	Snowy Owl	Landbirds										Y	
Y		Swamp Sparrow	Landbirds		Y				Y	Y				
Y		American Golden-Plover	Shorebirds		Y							Y		
Y		Least Sandpiper	Shorebirds			Y			Y	Y		Y		
	Y	Lesser Yellowlegs	Shorebirds											Y
	Y	Piping Plover (melodus)	Shorebirds											Y
	Y	Purple Sandpiper	Shorebirds											Y
	Y	Red Knot (rufa)	Shorebirds											Y
	Y	Sanderling	Shorebirds										Y	Y
Y		Semipalmated Sandpiper	Shorebirds		Y				Y	Y		Y		
Y	Y	Solitary Sandpiper	Shorebirds						Y	Y				Y
Y	Y	Whimbrel	Shorebirds		Y							Y		Y

Table A-2 continued

BCR 7 NL	MBU 10 NL	Priority Species	Bird Group	BCR 7 NL									MBU 10 NL	
				Coniferous	Shrub/early successional	Lichens/mosses	Herbaceous	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)
	Y	White-rumped Sandpiper	Shorebirds											Y
Y		Wilson's Snipe	Shorebirds						Y					
	Y	Atlantic Puffin	Waterbirds										Y	Y
	Y	Black-legged Kittiwake	Waterbirds										Y	Y
Y	Y	Common Loon	Waterbirds								Y	Y	Y	Y
	Y	Common Murre	Waterbirds										Y	Y
Y	Y	Common Tern	Waterbirds				Y				Y	Y	Y	Y
	Y	Cory's Shearwater	Waterbirds										Y	
	Y	Dovekie	Waterbirds										Y	
	Y	Great Shearwater	Waterbirds										Y	
	Y	Great Skua	Waterbirds										Y	
	Y	Ivory Gull	Waterbirds										Y	
	Y	Leach's Storm-Petrel	Waterbirds										Y	Y
	Y	Manx Shearwater	Waterbirds										Y	Y
	Y	Northern Gannet	Waterbirds										Y	Y
	Y	Razorbill	Waterbirds										Y	Y
	Y	Red-necked Grebe	Waterbirds										Y	Y
Y	Y	Red-throated Loon	Waterbirds						Y		Y		Y	

Table A-2 continued

BCR 7 NL	MBU 10 NL	Priority Species	Bird Group	BCR 7 NL									MBU 10 NL	
				Coniferous	Shrub/early successional	Lichens/mosses	Herbaceous	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)
	Y	Sooty Shearwater	Waterbirds										Y	
	Y	Thick-billed Murre	Waterbirds										Y	Y
Y	Y	American Black Duck	Waterfowl						Y		Y	Y	Y	Y
	Y	Barrow's Goldeneye (Eastern)	Waterfowl										Y	Y
Y	Y	Black Scoter	Waterfowl								Y		Y	
Y	Y	Canada Goose (North Atlantic)	Waterfowl		Y				Y		Y	Y	Y	Y
	Y	Common Eider	Waterfowl										Y	Y
Y	Y	Common Goldeneye	Waterfowl							Y	Y	Y	Y	Y
	Y	Common Merganser	Waterfowl								Y		Y	Y
Y		Green-winged Teal	Waterfowl						Y	Y	Y	Y		
Y	Y	Harlequin Duck (Eastern)	Waterfowl								Y	Y	Y	Y
	Y	King Eider	Waterfowl										Y	
Y	Y	Long-tailed Duck	Waterfowl						Y		Y		Y	Y
Y		Ring-necked Duck	Waterfowl						Y		Y			
Y	Y	Surf Scoter	Waterfowl						Y	Y	Y		Y	Y
	Y	White-winged Scoter	Waterfowl								Y		Y	

List of All Regional Threats in BCR 7 NL and MBU 10 NL

Table A-3: List of all the regional threats (with rolled-up rankings at the sub-threat level) sorted by threat sub-category (sub-categories are numbered as per Salafsky et al. 2008) summarized across habitat classes in BCR 7 NL and MBU 10 NL. "Y" means that the threat was associated with the particular habitat class in the planning unit. The rolled-up score for each sub-threat for each habitat is also provided. L: Low, M: Medium, H: High, VH: Very High.

	BCR 7 NL									**MBU 10 NL**	
Regional Threats	**Coniferous**	**Lichens/mosses**	**Shrub/early successional**	**Herbaceous**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**
1.1 Housing & urban areas	L				L	L	L	L	L		L
Habitat loss due to urban development	Y					Y	Y	Y	Y		
Habitat degradation due to coastal development											Y
Loss of nesting sites due to modernization of flat gravel rooftops to smooth surfaces.					Y						
1.2 Commercial & industrial areas					L						
Loss of nesting sites due to modernization of flat gravel rooftops to smooth surfaces.					Y						
1.3 Tourism & recreation areas									L		
Habitat loss due to tourism and recreational housing development									Y		
2.2 Wood & pulp plantations	L						L				
Habitat degradation due to forest structure changes from reforestation	Y						Y				

Table A-3 continued

	BCR 7 NL									MBU 10 NL	
Regional Threats	Coniferous	Lichens/mosses	Shrub/early successional	Herbaceous	Urban	Inland waterbodies	Wetlands	Riparian	Coastal (above high tide)	Marine waters	Coastal (intertidal)
2.4 Marine & freshwater aquaculture										L	L
Competition for resources or foraging areas with aquaculture farms										Y	Y
3.2 Mining & quarrying			L					L	L		
Loss of breeding habitat (e.g., cliffs, ledges) due to mining development			Y					Y	Y		
4.1 Roads & railroads	L	L	L		L		L	L	L		
Mortality due to collisions with moving vehicles	Y	Y	Y		Y		Y	Y	Y		
4.2 Utility & service lines	L	L	L		L		L	L	L		
Mortality due to collisions with tall structures (e.g., towers)	Y		Y				Y	Y			
Mortality due to collisions with utility or transmission lines	Y	Y	Y		Y		Y	Y	Y		
4.4 Flight paths	L		L		L	L	L	L	L		
Reduction in fecundity due to disturbance from aircrafts (e.g., low-level flying)	Y		Y			Y	Y	Y	Y		
Mortality due to collisions with aircrafts	Y		Y		Y		Y	Y	Y		
5.1 Hunting & collecting terrestrial animals	L	L	L		L	L	L	L	L	L	L
Legal hunting			Y			Y	Y	Y	Y	Y	Y
Poaching (e.g., eggs, nestlings) and incidental take by hunters or trappers	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y
5.2 Gathering terrestrial plants							L				
Habitat loss due to peat mining							Y				

Table A-3 continued

	BCR 7 NL									MBU 10 NL	
Regional Threats	Coniferous	Lichens/mosses	Shrub/early successional	Herbaceous	Urban	Inland waterbodies	Wetlands	Riparian	Coastal (above high tide)	Marine waters	Coastal (intertidal)
5.3 Logging & wood harvesting	L						L	L			
Habitat loss or degradation due to clear cutting, fragmentation and forest harvesting	Y						Y	Y			
Loss of breeding habitat, nesting sites and important habitat features due to forest harvesting	Y							Y			
Reduction in fecundity due to increased nest predation from forest fragmentation	Y										
5.4 Fishing & harvesting aquatic resources										H	L
Competition with commercial fisheries for prey										Y	
Mortality due to entanglement in fishing gear										Y	Y
6.1 Recreational activities	L		L	L		L	L		L	L	M
Habitat degradation due to resource development (e.g., new roads) or disturbance at migration sites (e.g., staging beaches, stopover sites)			Y			Y	Y		Y	Y	Y
Reduction in fecundity due to disturbance around nesting sites (e.g., motor boats, human activities near colonies)	Y		Y	Y		Y			Y	Y	Y
7.1 Fire & fire suppression	L						L				
Habitat loss or degradation from changes in forests age structure and removal of insect-infested trees due to fire suppression	Y						Y				
7.2 Dams & water management/use						L	L	L	L		L
Habitat loss or degradation due to changes in hydrology, water management and river channelization						Y	Y	Y	Y		
Habitat loss due to the drainage of saltmarshes											Y

Table A-3 continued

	BCR 7 NL									MBU 10 NL	
Regional Threats	**Coniferous**	**Lichens/mosses**	**Shrub/early successional**	**Herbaceous**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**
7.3 Other ecosystem modifications	L		L								
Habitat degradation due to forest regeneration	Y		Y								
8.1 Invasive non-native/alien species	L		L	L	L			L	L		M
Reduction in survival from introduced mammalian and avian predators (e.g., red squirrels)	Y			Y							Y
Reduction in survival due to predation by domestic cats	Y		Y		Y			Y	Y		
8.2 Problematic native species	L		L		L	L	L	L	L	L	H
Reduction in fecundity due to hybridization with Mallards						Y	Y		Y	Y	Y
Reduction in fecundity due to competition with Red-winged Blackbirds and Grackles for nesting sites	Y						Y	Y			
Reduction in fecundity due to competition with other grazing geese			Y			Y	Y		Y		
Increased predation due to an increase of predator populations as a result of land use practices	Y				Y		Y	Y			Y
9.2 Industrial & military effluents	L				L	L	L	L	L	VH	M
Habitat degradation due to chemical or heavy metal contamination from mining and industrial activities leading to pollutant exposure (e.g., mercury, PCBs, mining effluents etc.)						Y	Y		Y	Y	Y
Lethal/sublethal effects due to chemical or heavy metal contamination from mining and industrial activities leading to pollutant exposure (e.g., mercury, PCBs, mining effluents etc.)					Y	Y	Y	Y	Y	Y	Y
Mortality due to oil spills or discharges from ships and drilling platforms									Y	Y	Y

Table A-3 continued

	BCR 7 NL									MBU 10 NL	
Regional Threats	**Coniferous**	**Lichens/mosses**	**Shrub/early successional**	**Herbaceous**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**
9.3 Agricultural & forestry effluents	L		L			L	L	L	L	L	L
Habitat degradation due to chemical contamination						Y	Y		Y		
Lethal/sublethal effects due to pesticide contamination by direct exposure or consumption of contaminated prey	Y		Y				Y	Y	Y	Y	Y
Habitat degradation due to pesticide use altering food webs and abundance of prey species						Y	Y		Y		
9.4 Garbage & solid waste				L		L			L	L	L
Reduction in survival from ingestion of/and entanglement in garbage (e.g., plastics) and solid wastes				Y		Y			Y	Y	Y
11.1 Habitat shifting & alteration	L	M	H		L	M	H	H	H	L	H
Habitat loss or degradation due to climate change	Y		Y			Y	Y	Y	Y		Y
Habitat degradation due to changes in food webs and/or prey distribution and abundance		Y	Y		Y		Y	Y	Y	Y	Y
Habitat degradation from the shifting of species' ranges and the alteration of seasonal cue timing (e.g., migration or egg laying) due to climate change		Y	Y				Y	Y	Y		
11.3 Temperature extremes	L		L		L		L	M	L	M	M
Mortality due to temperatures extremes (e.g., thermal stress, cold snaps in spring)	Y		Y		Y		Y	Y	Y		Y
11.4 Storms & flooding	M				L		M	L	H	L	M
Habitat degradation or mortality due to increased frequency and severity of storms	Y				Y		Y	Y	Y	Y	Y

Table A-3 continued

	BCR 7 NL									MBU 10 NL	
Regional Threats	**Coniferous**	**Lichens/mosses**	**Shrub/early successional**	**Herbaceous**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**
12.1 Information lacking	H	H	H	L		M	VH	H	H	H	H
General lack of information	Y		Y	Y			Y		Y	Y	
Lack of reliable population trend information	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
Lack of knowledge of effects of changes in land use	Y		Y					Y			
Lack of information relating to declines and wintering habitat	Y						Y				Y
Lack of information – difficult to study on inaccessible breeding grounds	Y		Y				Y				
Lack of knowledge of effects of climate change on habitat		Y	Y				Y	Y	Y		Y

- breeding and non-breeding threats, and
- regional density and abundance.

The assessment is applied to individual bird species and ranks each species in terms of its biological vulnerability and population status. The assessments can be used to assign sub-regional (i.e., provincial section of a BCR), regional (BCR) and continental conservation priorities among birds.

Element 2: Habitats Important to Priority Species

Identifying the broad habitat requirements for each priority species in the breeding and non-breeding season allows species with shared habitat-based conservation issues or actions to be grouped. If many priority species associated with the same habitat class face similar conservation issues, then conservation action in that habitat class may support populations of several priority species. In most cases, all habitat associations identified in the literature are listed for individual species. Habitat associations do not indicate relative use, suitability ratings or rankings, nor selection or avoidance; this could be a useful exercise to undertake in the future.

In order to link with other national and international land classification schemes and to capture the range of habitat types across Canada, habitat classes for all priority species are based, at the coarsest level, on the hierarchical approach of the international Land Cover Classification System (LCCS) developed by the United Nations Food and Agriculture Organization (FAO 2000). Some modifications were made to the LCCS scheme to reflect habitat types that are important to birds that are not included in the classification (e.g., marine habitats). Species often are assigned to more than one of these coarse habitat classes. To retain the link to regional spatial data (provincial forest inventories, etc.), or to group species into regionally relevant habitat classes, individual BCR strategies may identify finer-scale habitat classes. Finer-scale habitat attributes and the surrounding landscape context were also captured when possible to better guide the development of specific conservation objectives and actions.

Element 3: Population Objectives

A central component of effective conservation planning is setting clear objectives that can be measured and evaluated. Bird Conservation Strategies set objectives based upon the conservation philosophies of national and continental bird initiatives, including the North American Bird Conservation Initiative (NABCI), that support conserving the distribution, diversity and abundance of birds throughout their historical ranges. The baselines for population objectives used in this planning exercise (those existing during the late 1960s, 1970s and 1990s for eastern waterfowl) reflect population levels prior to widespread declines. Most of the four bird conservation initiatives under the umbrella of NABCI have adopted the same baselines at the continental and national scale (waterfowl, shorebirds and landbirds; national and continental waterbird plans have not yet set population objectives). Some regions in the current planning effort have adjusted baselines to reflect the start of systematic monitoring. The ultimate measure of conservation success will be the extent to which population objectives have been reached. Progress towards population objectives will be regularly assessed as part of an adaptive management approach.

Population objectives for all bird groups are based on a quantitative or qualitative assessment of species' population trends. If the population trend for a species is unknown, the objective is usually "assess and maintain", and a monitoring objective is set. Harvested waterfowl and stewardship species that are already at desired population levels are given an objective of "maintain". For any species listed under the *Species at Risk Act* (SARA) or under provincial/territorial endangered species legislation, Bird Conservation Strategies defer to population objectives in available recovery documents. If recovery documents are not available, objectives are set using the same approach as for other species within that bird group. Once recovery objectives are available, they will replace interim objectives.

Element 4: Threat Assessment for Priority Species

Bird population trends are driven by factors that affect reproduction and/or survival during any point in the annual cycle. Threats that can reduce survival include, for example, reduced food availability at migratory stopovers or exposure to toxic compounds. Examples of threats that can reduce reproductive success may include high levels of nest predation or reduced quality or quantity of breeding habitat.

The threats assessment exercise included three main steps:

1. Conducting a literature review to itemize past, current and future threats for each priority species and classifying the threats using a standardized classification scheme (Salafsky et al. 2008).
2. Ranking the magnitude of threats for priority species following a standardized protocol (Kennedy et al. 2012).
3. Preparing a set of threat profiles for the BCR subregion, for broad habitat categories.

Each threat was categorized following the IUCN-CMP threat classification scheme (Salafsky et al. 2008) with the addition of categories to capture species for which we lack information. Only threats stemming from human activity were included in the threats assessment because they can be mitigated; natural processes that prevent populations from expanding beyond a given level were considered and noted, but no actions beyond research and/or monitoring were developed. Threats were ranked by assessing the scope (the proportion of the species' range within the subregion that is affected by the threat) and severity (the relative impact that the threat poses to the viability of the species' populations) of the threat. The scores for scope and severity were combined to determine an overall magnitude of low, medium, high or very high. These magnitudes were then rolled up by threat categories and sub-categories across habitat types (see Kennedy et al. 2012 for details on this process). The threats roll-up allows for comparison of the relative magnitude of the threats among threat categories and habitat types. The scoring and ranking of threats not only helps to determine which threats contribute most to population declines in individual species, but also allows us to focus attention on the threats with the greatest effects on suites of species or in broad habitat classes.

In BCR 7 NL and MBU 10 NL, a category was added to the threat classification scheme to address species with inadequate monitoring or research information (category 12 "Other direct threats" and sub-category 12.1 "Information lacking").

Element 5: Conservation Objectives

Overall, conservation objectives represent the desired conditions within the subregion that will collectively contribute to achieving population objectives. Objectives may also outline the research or monitoring needed to improve the understanding of species declines and how to best take action.

Currently, most conservation objectives are measurable using qualitative categories (e.g., decrease, maintain, increase) that will allow an evaluation of implementation progress, but they are not linked quantitatively to population objectives. Implementation that incorporates an active adaptive management process is an underlying principle of this conservation effort and will allow for future evaluation of whether or not reaching conservation objectives contributed to achieving population objectives.

Whenever possible, conservation objectives benefit multiple species and/or respond to more than one threat. However, where necessary, they focus on the specific requirements of a single species.

Conservation objectives generally fall into one of two broad categories:

- habitat objectives within the BCR subregion (the quantity, quality and configuration of priority habitats)
- non-habitat objectives within the BCR subregion (minimizing mortality by reducing predation, conducting education and outreach to reduce human disturbance, etc.)

Ideally, habitat objectives would reflect the type, amount and location of habitat necessary to support population levels of priority species outlined in the population objectives. Currently, there is a lack of data and tools at the BCR scale to develop these specific quantitative objectives. Threats-based objectives present the direction of change required to move toward the population objectives using the best available information and knowledge of ecosystem management strategies within broad habitat types.

Element 6: Recommended Actions

Recommended conservation actions are the strategies required to achieve conservation objectives. Recommended actions are usually made at the strategic level rather than being highly detailed and prescriptive. Actions were classified following the IUCN-CMP classification of conservation actions (Salafsky et al. 2008; see Appendix 3: IUCN Conservation Actions Categories) with the addition of categories to address research and monitoring needs. When possible, more detailed recommendations can be included, for example if beneficial management practices, ecosystem plans or multiple recovery documents are available for a subregion. However, actions should be detailed enough to provide initial guidance for implementation.

The objectives for research, monitoring and widespread issues may not have actions associated with them. These issues are often so multi-faceted that actions are best designed in consultation with partners and subject-matter experts. Implementation teams will be better positioned to address these complex issues, drawing input from various stakeholders.

Recommended actions defer to or support those provided in recovery documents for species at risk at the federal, provincial or territorial level, but because these strategies are directed at multiple species, actions are usually more general than those developed for individual species. For more detailed recommendations for species at risk, readers should consult recovery documents.

Appendix 3

Tables adapted from Salafsky et al. (2008).

IUCN Threat Categories

Table A-4: International Union for Conservation of Nature-Conservation Measures Partnership (IUCN-CMP) classification of threats to biodiversity as per Salafsky et al. (2008).
Note that not all threat categories apply to birds or occur in every BCR or MBU.

Threat Category/Sub-category	Definition
1 Residential and commercial development	Human settlements of other nonagricultural land uses with a substantial footprint
1.1 Housing and urban areas	Human cities, towns and settlements including non-housing development typically integrated with housing
1.2 Commercial and industrial areas	Factories and other commercial centers
1.3 Tourism and recreation areas	Tourism and recreation sites with a substantial footprint
2 Agriculture and aquaculture	Threats from farming and ranching as a result of agricultural expansion and intensification, as well as silviculture, mariculture and aquaculture
2.1 Annual and perennial non-timber crops	Crops planted for food, fodder, fiber, fuel or other uses
2.2 wood and pulp plantations	Stands of timber planted for timber or fiber outside natural forests, often with non-native species
2.3 Livestock farming and ranching	Domestic terrestrial animals raised in one location on farmed of nonlocal resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching)
2.4 Marine and freshwater aquaculture	Aquatic animals raised in one location on farmed or nonlocal resources; also hatchery fish allowed to roam in the wild
3 Energy production and mining	Threats from production of non-biological resources
3.1 Oil and gas drilling	Exploring for, developing, and producing petroleum and other liquid hydrocarbons
3.2 Mining and quarrying	Exploring for, developing, and producing minerals and rocks
3.3 Renewable energy	Exploring, developing and producing renewable energy
4 Transportation and service corridors	Threats from long, narrow transport corridors and the vehicles that use them including associated wildlife mortality
4.1 Roads and railroads	Surface transport on roadways and dedicated tracks
4.2 Utility and service lines	Transport of energy and resources
4.3 Shipping lanes	Transport on and in freshwater and ocean waterways
4.4 Flight paths	Air and space transport

Table A-4 continued

Threat Category/Sub-category	Definition
5 Biological resource use	Threats from consumptive use of "wild" biological resources including deliberate and unintentional harvesting effects; also persecution or control of specific species
5.1 Hunting and collecting terrestrial animals	Killing or trapping terrestrial wild animals or animal products for commercial, recreation, subsidence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
5.2 Gathering terrestrial plants	Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsidence, research or cultural purposes, or for control purposes
5.3 Logging and wood harvesting	Harvesting trees and other woody vegetation for timber, fiber, or fuel
5.4 Fishing and harvesting aquatic resources	Harvesting aquatic wild animals or plants for commercial, recreation, subsidence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
6 Human intrusions and disturbance	Threats from human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources
6.1 Recreational activities	People spending time in nature or travelling in vehicles outside established transport corridors, usually for recreation purposes
6.2 War, civil unrest and military exercises	Actions by formal or paramilitary forces without a permanent footprint
6.3 Work and other activities	People spending time in or travelling in natural environments for reasons other than recreation or military activities
7 Natural system modifications	Threats from actions that convert or degrade habitat in service of "managing" natural or semi-natural systems, often to improve human welfare
7.1 Fire and fire suppression	Suppression or increase in fire frequency and/or intensity outside of its natural range of variation
7.2 Dams and water management/use	Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities
7.3 Other ecosystem modifications	Other actions that convert or degrade habitat in the service of "managing" natural systems to improve human welfare.
8 Invasive and other problematic species and genes	Threats from non-native and native plants, animals, pathogens/microbes, or genetic material that have or are predicted to have harmful effects on biodiversity following their introduction, spread, and/or increase in abundance
8.1 Invasive non-native/alien species	Harmful plants, animals, pathogens and other microbes not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities

Table A-4 continued

Threat Category/Sub-category	Definition
8.2 Problematic native species	Harmful plants, animals, pathogens and other microbes that are originally found within the ecosystem(s) in question, but have become "out of balance" or "released" directly or indirectly due to human activities
8.3 Introduced genetic material	Human-altered or transported organisms or genes
9 Pollution	Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources
9.1 Household sewage and urban waste water	Water-borne sewage and nonpoint runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments
9.2 Industrial and military effluents	Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments
9.3 Agricultural and forestry effluents	Water-borne pollutants from agricultural, silvicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on the site where they are applied
9.4 Garbage and solid waste	Rubbish and other solid materials including those that entangle wildlife
9.5 Air-borne pollutants	Atmospheric pollutants from point and non-point sources
9.6 Excess energy	Inputs of heat, sound or light that disturb wildlife or ecosystems
10 Geological events	Threats from catastrophic geological events
10.1 Volcanoes	Volcanic events
10.2 Earthquakes/tsunamis	Earthquakes and associated events
10.3 Avalanches/landslides	Avalanches or landslides
11 Climate change and severe weather	Long-term climatic changes that may be linked to global warming and other severe climatic or weather events outside the natural range of variation that could wipe out a vulnerable species or habitat
11.1 Habitat shifting and alteration	Major changes in habitat composition and location
11.2 Droughts	Periods in which rainfall falls below the normal range of variation
11.3 Temperature extremes	Periods in which temperatures exceed or go below the normal range of variation
11.4 Storms and flooding	Extreme precipitation and/or wind events or major shifts in seasonality of storms
*12 Other direct threats**	Other threats
12.1 Information lacking	Lack of clearly documented threats

* Note that this category is not part of the IUCN classification system and was added as part of the BCR planning process to address species of concern for which threats are not clearly documented and/or are unknown.

IUCN Conservation Action Categories

Table A-5: International Union for Conservation of Nature-Conservation Measures Partnership (IUCN-CMP) classification of conservation actions.

Note that not all categories of actions were applicable or were recommended in each BCR or MBU. Encouraging industry compliance with voluntary beneficial management practices was classified under 5.3 Private sector standards and codes.

Action Category/Sub-category	Definition
1 Land/water protection	Actions to identify, establish or expand parks and other legally protected areas, and to protect resource rights
1.1 Site/area protection	Establishing or expanding public or private parks, reserves, and other protected areas roughly equivalent to IUCN categories I-VI
1.2 Resource and habitat protection	Establishing protection or easements of some specific aspect of the resource on public or private lands outside IUCN categories I-VI
2 Land/water management	Actions directed at conserving or restoring sites, habitats and the wider environment
2.1 Site/area management	Management of protected areas and other resource lands for conservation
2.2 Invasive/problematic species control	Eradication, controlling, and/or preventing invasive and/or other problematic plants, animals and pathogens
2.3 Habitat and natural process restoration	Enhancing degraded or restoring missing habitats and ecosystem functions; dealing with pollution
3 Species management	Actions directed at managing or restoring species, focused on the species of concern itself
3.1 Species management	Managing specific plant and animal populations of concern
3.2 Species recovery	Maintaining, enhancing, or restoring specific plant and animal populations, vaccination programs
3.3 Species reintroduction	Reintroducing species to places where the formally occurred or benign introductions
3.4 *ex situ* conservation	Protecting biodiversity out of its native habitats
4 Education and awareness	Actions directed at people to improve understanding and skills, and influence behavior
4.1 Formal education	Enhancing knowledge and skills of students in a formal degree program
4.2 Training	Enhancing knowledge, skills, and information exchange for practitioners, stakeholders, and other relevant individuals in structured settings outside degree programs
4.3 Awareness and communications	Raising environmental awareness and providing information through various media or civil disobedience
5 Law and policy	Actions to develop, change, influence, and help implement formal legislation, regulations, and voluntary standards
5.1 Legislation	Making, implementing, changing, influencing, or providing input into formal government sector legislation or policies at all levels: international, national, state/provincial, local, tribal
5.2 Policies and regulations	Making, implementing, changing, influencing, or providing input

Table A-5 continued

Action Category/Sub-category	Definition
	into policies and regulations affecting the implementation of laws at all levels: international, national, state/provincial, local, tribal
5.3 Private sector standards and codes	Setting, implementing, changing, influencing, or providing input into voluntary standards and professional codes that govern private sector practice
5.4 Compliance and enforcement	Monitoring and enforcing compliance with laws, policies and regulations, and standards and codes at all levels
6 Livelihood, economic and other incentives	Actions to use economic and other incentives to influence behavior
6.1 Linked enterprises and livelihood alternatives	Developing enterprises that directly depend on the maintenance of natural resources of provide substitute livelihoods as a means of changing behaviors and attitudes
6.2 Substitution	Promoting alternative products and services that substitute for environmentally damaging ones
6.3 Market forces	Using market mechanisms to change behaviors and attitudes
6.4 Conservation payments	Using direct or indirect payments to change behavior and attitudes
6.5 Non-monetary values	Using intangible values to change behavior and attitudes
7 External capacity building	Actions to build infrastructure to do better conservation
7.1 Institutional and civil society development	Creating or providing nonfinancial support and capacity building for nonprofits, government agencies, communities, and for-profits
7.2 Alliance and partnership development	Forming and facilitating partnerships, alliances, and networks of organizations
7.3 Conservation finance	Raising and providing funds for conservation work
*8 Research and monitoring**	Gathering information about species or habitat of concern
8.1 Monitoring	Establishing new or supporting, continuing, and/or expanding existing monitoring schemes to gather required data about individual or groups of species or habitats
8.2 Research	Undertaking new or supporting, continuing and/or expanding existing research relating to specific species or threats

* Note that this category is not part of the IUCN classification system and was added as part of the BCR planning process to address certain actions that do not fit elsewhere in the IUCN scheme.

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